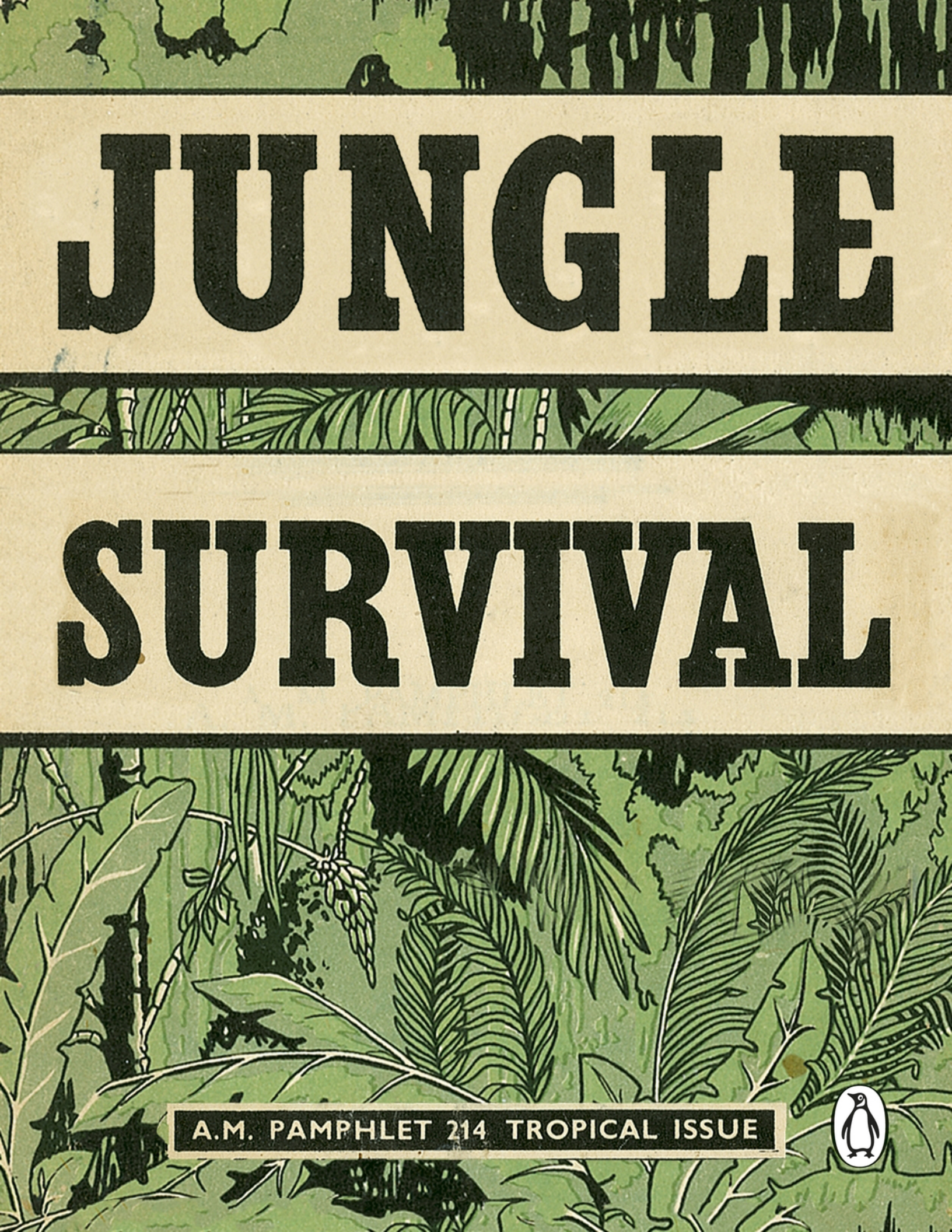
JUNGLE SURVIVAL



A.M. PAMPHLET 214 TROPICAL ISSUE

A.M. Pamphlet 214

JUNGLE SURVIVAL

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RESTRICTED

Jungle Survival

INTRODUCTION

1. There is no standard form of jungle and the word implies either wet tropical rain forest, which is the jungle we usually think about, or dry open scrub country; it refers to any natural uncultivated forest in tropical or sub-tropical lands.

2. Jungle is not constant in composition even in the same climatic zones. Its vegetation depends on the altitude, and, to a large extent, on the influence of man through the centuries. Tropical trees take over 100 years to reach maturity and are only fully grown in untouched primeval virgin forest. This is called “primary” jungle and is easily recognized by its abundance of giant trees 150 feet to 200 feet high and up to 10 feet in width at the base. The tops of the trees form a dense carpet over 100 feet from the ground beneath which there is little light and therefore comparatively little undergrowth: consequently travel is not too difficult in most primary jungle and its animal inhabitants live mainly in the upper branches.

3. Jungle is not all primary. Far eastern hill tribesmen grow one rice crop a year by burning down a suitable area of jungle and planting seed in the ashes which form a natural fertiliser. When the harvest is gathered the tribe moves on to find a fresh jungle area to be burned for next year’s crop. In

this way one tribe will devastate large areas of primary jungle in a decade. European exploitation has added to the cleared area by felling accessible tall timber along river banks. The cleared area is soon reclaimed by the jungle, but by jungle without tall trees and composed of dense undergrowth and creepers. This is “secondary” jungle and it is much harder to traverse than primary jungle, but it is better for forced landing or parachute descent because of the absence of giant trees.

4. In most far eastern countries, the secondary jungle is greater in extent than the untouched primary jungle. The latter is now found only in the most inaccessible mountainous country or in areas of forest reserve, preserved by colonial governments for water catchment or other reasons. Don’t, however, believe that all the tropics consist of jungle of any sort. Well over half the land is cultivated in some way or other and you will find rubber plantations, tea plantations, coconut plantations, and native allotments. You should learn to recognize these from the air as they are a sure indication of human activities. Remember that neither rubber trees nor coconut palms grow wild in any quantity, and if the plantation is there then the planter cannot be far off. He may only be an isolated Malay but he has to sell his crop somewhere, so he will have good though infrequent contacts with civilization. Remember, too, that rubber trees must be tapped daily to draw off the valuable sap, so that if you get into a rubber plantation you will be found within 24 hours.

5. Primary or secondary, the tropical rain jungle is a difficult and unpleasant land to live in and travel through. The soil is covered with dead and rotting vegetation over which leeches move in countless millions. Numerous other slugs, insects, and small animal life will be found, all in some way loathsome and unpleasant. In low-lying country the ground may be marshy and even under water, with only the trees and their buttressed roots showing the presence of soil below. Close to the ground will be found thick, and, in secondary forests, sometimes impenetrable, undergrowth containing a considerable number of plants, fruits, and vegetables, some edible and some poisonous. Over the undergrowth in primary jungle is the rather more open space beneath the jungle tree tops, with an abundance of all types of trees, creepers, and vines amongst which you will sometimes see animal and bird life. Over all this is the thick jungle top or umbrella through which little

light penetrates. Here amongst the tree tops may be found birds, bees, moths, monkeys, and so on. Yet, despite the teeming life of this jungle you may journey for several days and see no sign of it, so timid and shy are the majority of the inhabitants; and, among all these living things, you may starve if you are not jungle-wise.

6. The dry scrub country is more open than the wet jungle, and prickly-pear, cactus, and leafless cactus-like trees are common amid the thorny brakes and tall grass. It is tiresome to be caught in this country, for its lack of topographical features, population and tracks, make it difficult to find a way out. But patience, a compass, and common sense will do the trick.

7. Despite all the perils and unpleasantness of the jungle, thousands of Englishmen have lived and travelled in it safely for months on end, and hundreds of them have enjoyed it and still do. With a little knowledge you can achieve safety if not enjoyment.

ESSENTIAL CHARACTERISTICS OF THE "JUNGLE HIKER"

8. Whatever the type of country into which you are unfortunate enough to crash-land, or "bale-out", or if after a successful ditching you make a landfall on some small tropical island, your chances of survival and eventual rescue depend on a few definite factors. By far the most important of these is the first, "determination to live"; but together they will give you the morale to bring you through:—

(*a*) Determination to live.
(*b*) Previous knowledge; ignorance of a few simple rules on the part of one member of the party is a danger to the remainder.
(*c*) Confidence in your knowledge of jungle and island life.
(*d*) Common sense and initiative.
(*e*) Discipline, and a previously considered plan of action.
(*f*) Ability to learn by your mistakes.

ACTION DURING EMERGENCY

9. The ways of getting into the jungle are baling-out or crash-landing, and the decision will be dependent on the circumstances at the time of the emergency. But whichever course is chosen, on the way down, make a mental note of the following:—

(*a*) The character of the country into which you are going. Consider the relative positions of rivers, lakes, clearings, paddy fields, high ground, ridges, villages, in fact anything which might be of use to you later on.

(*b*) Try to pin-point yourself in relation to one of these, *i.e.* get a mental note of the bearing.

(*c*) If baling-out into thick jungle, it will be vital that you should have some idea of the heading or bearing of the aircraft, or members of the crew in relation to each other, as once "in", it will be found extremely difficult to make contact if you have no knowledge of your relative positions.

To Jump or Not to Jump

10. If the terrain is at all suitable it is normally better to crash-land than to bale-out. However, if you are over mountainous country, or if the aircraft is on fire or out of control, a crash-landing may be out of the question. To sum up, the advantages of staying with your aircraft are:—

(*a*) The crew is not separated and no member of it will be left alone. This is most desirable from the morale aspect.

(*b*) All the equipment in the aircraft will be available and it will be possible to improvize other essential items from airframe and engine parts.

(*c*) The fuselage, if intact, provides shelter from animals, insects, and weather.

(*d*) The aircraft or its wreckage is plainly visible from the air.

11. In contrast, baling-out offers only one distinct advantage, that is, the ability to get you down safely on almost any sort of country. However, try not to bale-out over primary jungle if you can avoid it, as you will almost certainly sustain some sort of injury when you land in the tree tops, and you may even find yourselves dangling twixt heaven and earth over a hundred feet from the ground.

12. For the reasons outlined above, if you have to bale-out over a jungle, try to arrange a rendezvous for the crew before you jump. The best rendezvous is your wrecked aircraft and you can decide on that action before you even take-off on a flight.

FORCED LANDING GROUNDS—SUITABLE TERRAIN

13. The jungle does not offer much in the way of forced-landing areas, but if you have any choice or time to make a selection, consider the areas mentioned below, in order of preference:—

(*a*) Beaches.
(*b*) Clearings.
(*c*) Paddy fields—land along the "bunds", *i.e.* banks of mud dividing the fields.
(*d*) Lakes and rivers.

Do not land on tree tops—if it has to be the tree tops, bale-out if there is the height and time to carry out the drill, with due consideration to all those in the aircraft.

IMMEDIATE ACTION ON LANDING

14. The planning of a standard procedure is essential to the ultimate success of the incident, and the following immediate actions should be carried out after landing. This procedure or drill is, of course, subsequent to the normal crash landing drills, precautions against fire, etc.:—

(*a*) ***First Aid.*** Administer immediate first aid to the slightest scratch. In hot and tropical climates the risk of poisoning from an open wound is very great.
(*b*) ***Fix Position.*** You cannot decide on a reliable plan of action until you have decided just where you are. You may not be able to fix your position to the nearest mile, but you must be able to say "I am within this area". If the aircraft is intact, use the sextant, chronometer, and altimeter to help fix your position.
(*c*) ***Rendezvous if Scattered.*** The place for rendezvous after parachute landing should normally be the wreckage of the

aircraft. If the captain has sufficient time before ordering his crew to jump, he may decide to rendezvous at some geographical landmark. If so, he must ensure that all the crew know and can recognize the point of rendezvous and that the landmark is prominent, *e.g.* the confluence of two rivers.

(*d*) ***Establish Two-way Radio Contact if Possible.*** If the aircraft radio equipment is intact, try and contact the outside world on W/T or R/T. Erect an emergency aerial if necessary and run one of the engines to maintain power if you can do so without risk of fire.

(*e*) ***Prepare all Signalling Gear for Immediate Use.*** You will not have time to prepare signalling fires, etc., if you wait until you see aircraft searching for you. Have fires lighted in readiness for the search aircraft and keep oil and petrol near the fires so that you can produce a dense column of smoke at short notice. The petrol will make a rapid flare-up by night. Consider what steps can be taken to make the scene of the incident more noticeable from the air. Make a clearing for the display of ground signals (see here), or move to a clearing nearby if you can find one. Spread out parachutes and polished aluminium panels to reflect the sun. Try and evolve signalling methods which will show above the jungle top, *i.e.* smoke columns or parachutes spread over the trees.

(*f*) ***Check Emergency Equipment, including Rations.*** Check the survival equipment available from your personal kits and emergency packs. Examine the other equipment in the aircraft and decide what will be of use to you, *e.g.* fire axe, compasses, parachutes, etc. Drain-off supplies of petrol and oil for signalling purposes, check all available rations and water supplies. Try and repair any unserviceable or faulty equipment.

(*g*) ***Institute Immediate Rationing.*** No matter how much food and water you have, you should attempt to conserve it as long as possible by rationing. Do not cut the water ration below one pint per person per day unless in dire emergency. If food and water supplies from the aircraft are scanty, take immediate steps to implement them from natural sources. Don’t leave it until you are too weak before you begin to hunt for your meals. If you can get food and water locally do so, and reserve your emergency rations for a real emergency.

(*h*) ***Elect a Leader and Delegate Duties.*** Normally the captain of aircraft will act as leader, but in special circumstances another member of the crew may be better suited. The captain may be injured, or one of his crew may be a jungle expert. In any event make a decision and stick to it. Each member of the crew should be given a special job, *e.g.* cooking, collecting water, building shelters, preparing signal gear, collecting edible plants, etc. Boredom and apathy can be dangerous to an idle man.

(*j*) ***Relax and Formulate a Plan of Action.*** After you have checked your equipment, don't be in too much of a hurry to start on "trek" towards the nearest town. There may be very good reasons for staying with the aircraft and there is plenty of time for careful thought. Assume from the start that you are in for several days in the jungle and another 24 hours either way will not make much difference. A good night's sleep in a well constructed jungle camp will make all the difference to a shaken crew. ***Do not*** relax if you have force-landed in enemy territory.

PLAN OF ACTION

15. If in wartime you have landed behind enemy lines, you must leave the scene of the crash at once. It may be advisable to split a large crew into parties of three or four men than to travel together. Once you are well clear of your crashed aircraft, set course for the nearest allied or neutral territory.

16. In peacetime or in friendly territory you must decide whether it is better to stay with the aircraft wreckage or to set out towards the nearest civilization. You may even decide to split the crew and leave some men with the aircraft while others go for help. The main consideration is: *Are search aircraft likely to find you in less time than it will take to walk to civilization?* Once you start on "trek" there is little likelihood of your being seen from the air.

17. Once you have come to a decision based on careful consideration, put it into effect at once and stick to it. Your mental processes will be strained after several days in the jungle and you may later be tempted wrongly to

abandon a good plan before it has had time to mature. Persevere and you will be successful.

18. Factors on which to base your decision are:—

(*a*) Do the authorities know that you have force-landed and do they know the position of the incident? If so, you will soon be found if you stay with the aircraft.

(*b*) If your position is not known, were you on track as per flight plan at the time of the crash? If you are missing, the first search will be along this track.

(*c*) Is the aircraft wreckage easily visible from the air? Can you make it visible?

(*d*) Have local forces sufficient aircraft at their disposal for an effective search; have the aircraft sufficient range to reach you?

(*e*) Is the weather favourable for search aircraft?

(*f*) Are transit or other aircraft likely to fly over your position? If so, how frequently?

(*g*) Do you know your own position accurately? If so, are you in easy reach of any known human habitation? Is the country between it and your present position easy to traverse? How long will the journey take you?

(*h*) Are all the crew fit for a journey through the jungle? Is any member so seriously injured as to need immediate medical aid? In the latter event, it may be advisable to send one party off for help while others stay with the injured man.

(*j*) Have you good supplies of survival equipment for a long march through the jungle: compasses, matches, etc.?

(*k*) What are your supplies of food and water? Consider the supplies available from aircraft emergency packs and those obtainable from natural sources. Is there a good water supply near your wrecked aircraft? Will you be able to live off the jungle when your emergency rations are expended?

(*l*) Lastly, how much do you know about jungle survival? If you have little confidence in your knowledge, stay where you are.

19. If you decide to remain with the aircraft you must ensure that every possible means of attracting attention is ready for instant use. Sound does

not travel through thick jungle vegetation, so you can expect little warning of an approaching aircraft, and should one come within range the opportunity must not be lost. See that you are prepared and try to erect as many permanent indicators as you can.

(*a*) ***Permanent Ground Signals.*** Parachute canopies spread out preferably over tree tops or in open clearings. Yellow dinghies inflated and placed in clearings. Bright panels or cowlings spread out near the aircraft, broken glass, the aerial kite flown above the tree tops, white clothing spread out on a line.

(*b*) ***Distress Signals.*** Flame fires using petrol or dried wood by night; smoke fires, using oil or damp leaves by day; (keep fires lit all the time if the local wood is damp and fires are difficult to light); pyrotechnics; and fluorescence in streams.

20. If you intend to leave the aircraft you must first decide how much equipment to take with you. Don’t take too much as you will soon find it heavy and cumbersome. Take such items as parachute canopies, for tents and hammocks; shroud lines for ropes, etc.; personal survival kits, first aid kits, fire axes and food and water. If you have not all got tropical back-packs a good container can be made from the parachute pack by cutting away surplus webbing. Another method of carrying equipment is to sling it on a long pole carried between the shoulders of two men. Don’t discard too much clothing when setting out on “trek”. The jungle is cold at night and you will need protective covering against mosquitoes and leeches, etc. Gloves are invaluable for clearing away thorns. When you leave the aircraft wreckage display a prominent notice saying where you have gone, and spread out the appropriate Ground Air Emergency signal.

JUNGLE HAZARDS

21. The large majority of people have an entirely erroneous impression of the risks and dangers involved in jungle travel. The majority think immediately of the big game, snakes, and other reptiles; so it must be made perfectly clear, that though the wild animals may abound in jungle country, they are as much concerned about keeping out of your way as, no doubt, you will be about keeping out of theirs. Where then are the dangers, from what source, and direction?

22. The greatest dangers lie in the demoralizing and cumulative effect of sometimes rather insignificant factors, which may be summarized under the following headings:—

(*a*) Panic.
(*b*) Sun and heat, and sickness therefrom.
(*c*) Sickness, and fever—malaria, dysentery, sand-fly, typhus—are some of the more common.
(*d*) Demoralizing effect and danger from all forms of animal life.
(*e*) Poisoning, by eating or contact with plants. (See paras. 99 and 100.)

Most of these hazards are avoidable by taking precautions as provided by Service medical treatment, plus an elementary knowledge of personal hygiene.

Effects of Sun and Heat

23. The sun is highly dangerous because the effects are so frequently ignored. It causes sunstroke—or heatstroke—sunburn, and what is often referred to as heat exhaustion.

24. Sunstroke may occur at any time, day or night; the victim becomes feeble and giddy, his throat is dry, he suffers from thirst, his skin becomes cold and clammy, the pulse increases and weakens, his temperature rises, he appears flushed, and he vomits. Move the victim into the shade, where there is a free circulation of air, strip to the waist and place in a sitting position on the ground. If possible spray cold water over the head and back, and give the victim ice or cold water; as the temperature falls cover him with a blanket, and ensure he remains in the shade.

25. The prevention of sunburn is much easier than its treatment; remember this when in the tropics. Many people become severely burned because they fail to realize that the effects of sunburn are not felt until too late; that is, when you notice your skin turning pink, or feeling hot. When hazy or overcast, danger from sunburn is greater, as it is even less noticeable, there being so much reflected light. Should sunburn affect more than two-thirds of your body, it is likely to prove fatal. Therefore go carefully, take the

precaution of keeping out of the sun as much as possible, and allow your skin to tan slowly, after which the dangers from sunburn are somewhat reduced.

26. Heat exhaustion is caused from long and continuous exposure to heat with high humidity, and may occur without direct exposure to the sun. The skin becomes cold and clammy with sub-normal temperature; the only cure is to get into the shade, and cover yourself to avoid becoming chilled, taking plenty of water and salt. Salt tablets should be taken daily if you have an ample supply of water available. Don't take them if water is scarce, as they will increase your thirst.

Sickness and Fever

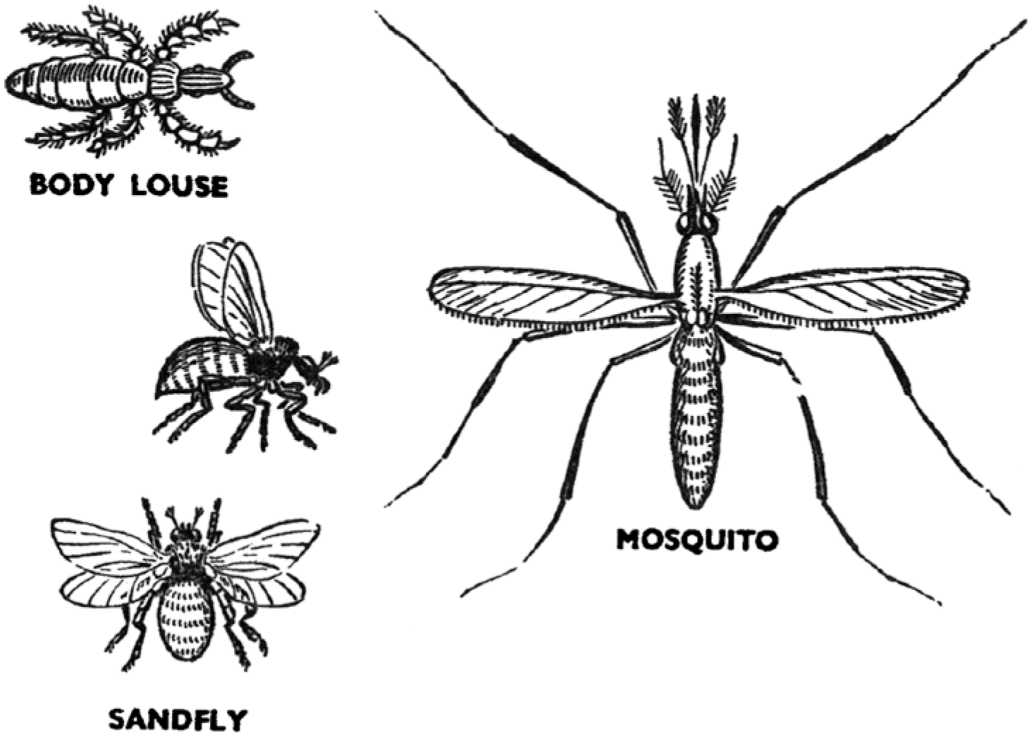
27. ***Malaria.*** This is caused by the bite of an infected mosquito and the fever occurs at regular intervals after the first attack. As it begins the victim feels chilly and shivers; later in the attack he feels a burning fever. The hot and cold fevers alternate throughout the illness. Malaria may be prevented or minimized in two ways: by taking mepacrine consistently, and by avoiding mosquito bites. The latter course entails wearing long-sleeved coats and long trousers at all times. The jungle mosquito does not bite only by night, as the jungle is always protected from direct sunlight. The treatment for malaria is rest, copious drinks of water, and strong doses of mepacrine, six to eight tablets per day, until the attack is over. Once the temperature falls the patient can continue working or marching but there may be minor after-effects for some days.

28. ***Dysentery.*** Caused by eating or drinking polluted food or water. There are two types, but both have the same symptoms which are severe inflammation of the bowels and abdominal pains, and severe and continuous diarrhoea accompanied by green and bloody faeces. To prevent dysentery see that all doubtful food is cooked and all water purified. Be particularly careful near native villages where the vegetables, etc., are often fertilized with human excreta. To treat dysentery, sulphaguanadine is supplied in the tropical first-aid kit. Routine treatment is to put the patient on a soft liquid diet of milk, boiled rice, coconut milk, boiled bread, etc. The patient should take plenty of boiled water. Ordinary diarrhoea, which may be mistaken for dysentery, is often caused by stomach chills at night.

To avoid chill, wrap a towel or cummerbund around your stomach when you go to sleep no matter how hot you feel.

29. ***Sandfly Fever.*** Caused by the bite of the sandfly and has symptoms similar to malaria. To avoid the fever don't get bitten. Treatment as for malaria.

30. ***Typhus.*** Usually caused by the bite of an infected louse or a tick. The symptoms are a severe headache, weakness, fever and aching, the victim's face turns dusky, the tongue and lips become coated with a brown fur and on the fifth day the skin becomes mottled and covered with a bright pink rash. Typhus is likely to prove fatal without medical attention. It can be avoided by regular innoculation and by personal cleanliness. Ensure that all ticks are removed from the skin and check clothes daily for lice; wash the body at least once a day.



Danger from Forms of Animal Life

31. The forms of animal life differ in various parts of the world and a certain type might be dangerous to man in one part and not in another. The

most deadly form of animal life is the mosquito which is found all over the world in different forms, but it can only be dangerous in certain areas.

32. ***Mosquitoes.*** The anopheles mosquito carries malaria and is a menace against which every precaution should be taken.

(*a*) Always wear a mosquito net and leave no part of the body exposed.

(*b*) If you have no mosquito net, a handkerchief, parachute canopy or large leaf can be used as a makeshift.

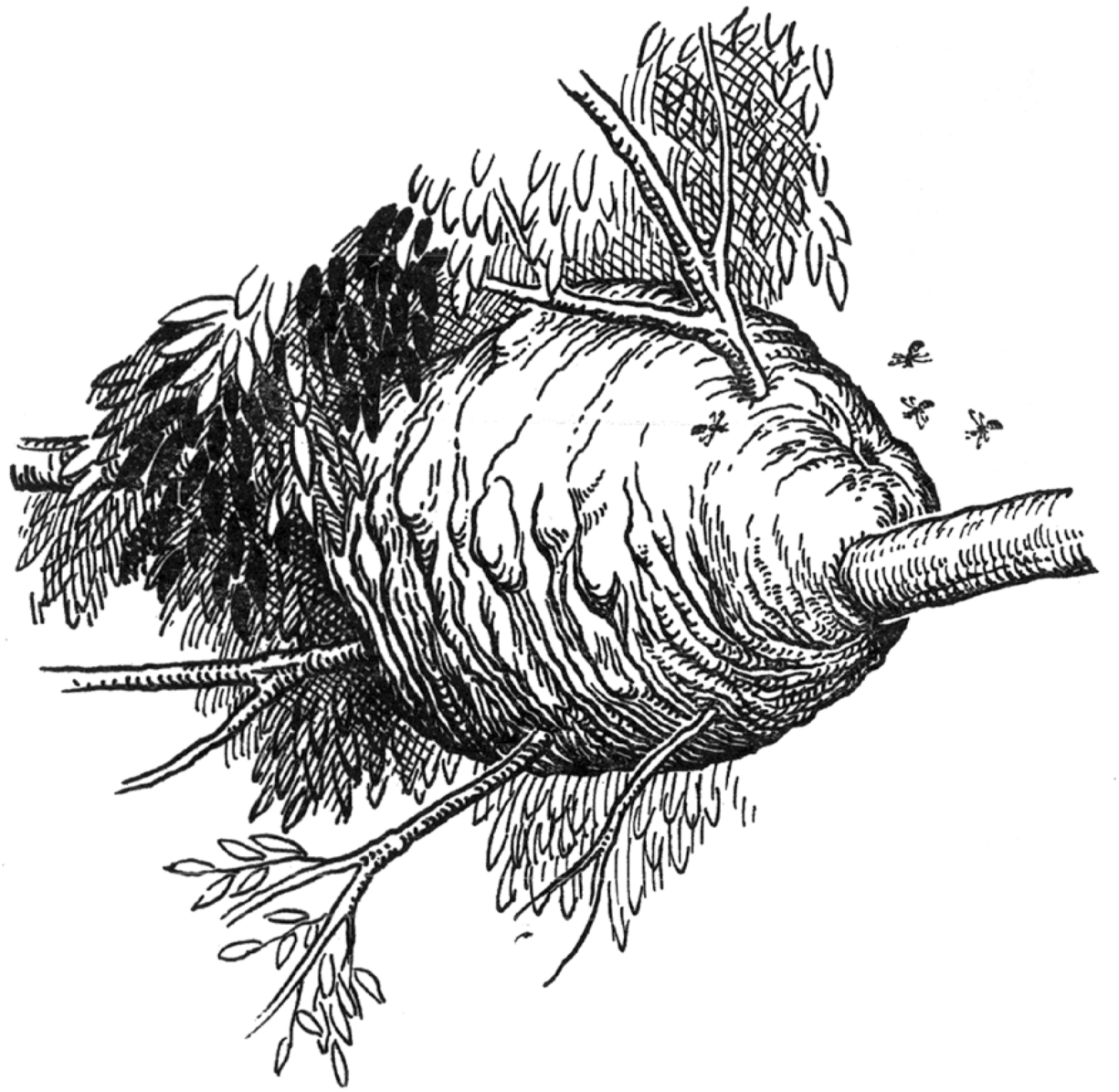
(*c*) At night in particular, but at all times if possible, have trouser legs tucked into the tops of your socks, and shirt or tunic sleeves into gloves.

(*d*) When encamped, have at all times a smoky fire burning and sleep to leeward of it.

(*e*) Keep away from swampy and stagnant areas when resting or camping in the jungle, for these are the mosquitoes' breeding ground.

(*f*) There is no preventive innoculation against malaria, so very strict observance of these anti-malarial measures must be insisted upon at all times.

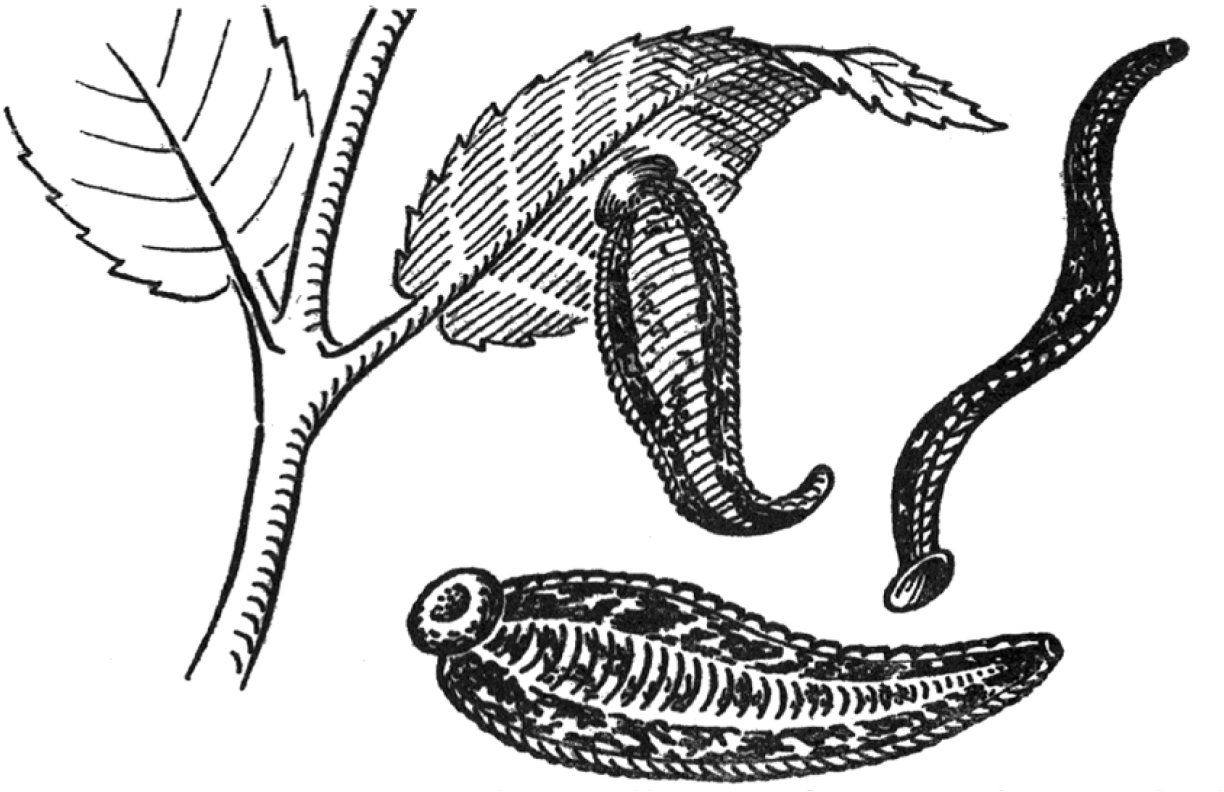
33. ***Wasps, Bees and Hornets.*** These are dangerous pests. Their nests are generally brownish bags or oblong masses on trunks and branches at a height of 10-30 feet, and often on dead standing trunks. If a nest is disturbed and you are some yards away, sit still for five minutes and then crawl carefully away. Wasps go for moving targets, but should you be attacked, run through the bushiest undergrowth.



HORNETS NET

34. ***Leeches.*** Never pull them off, as their jaws will remain in the bite, and possibly fester and irritate. When moving through the jungle, if smoking, keep the pieces of unburnt tobacco, and wrap them up in a piece of material. When de-leeching, moisten the bag so formed, and squeeze the nicotine onto the leech. Other methods of de-leeching are the juice of the raw lime, salt, ash, and ash from a cigarette-end, or pipe. By using these methods, you force the leech to withdraw its jaws from the flesh and to drop off, with no risk of infection. Leave the blood dot on the leech bite as long as possible, squeezing it slightly at first to ensure the wound is clean, and

the bleeding will stop in a few minutes. Leeches abound in lowland forest after rain, so keep a look out for these pests, and inspect your legs and boots every few minutes, and flick off any leech which has not yet got a hold. The large horse-leech will normally be found only in the sluggish lowland streams and swampy forest.



LEECHES

35. ***Ticks.*** Small grey ticks cause irritation, they swarm on plants or on dead fallen trunks, and might swarm onto a person in great numbers. Found during the wet season, ticks should immediately be removed from clothing, by hanging over or to leeward of a smoky fire; in the same way if ticks are on the body they can be smoked off. Remember also, when dealing with dead game, that ticks thrive on game, and especially on wild pig.

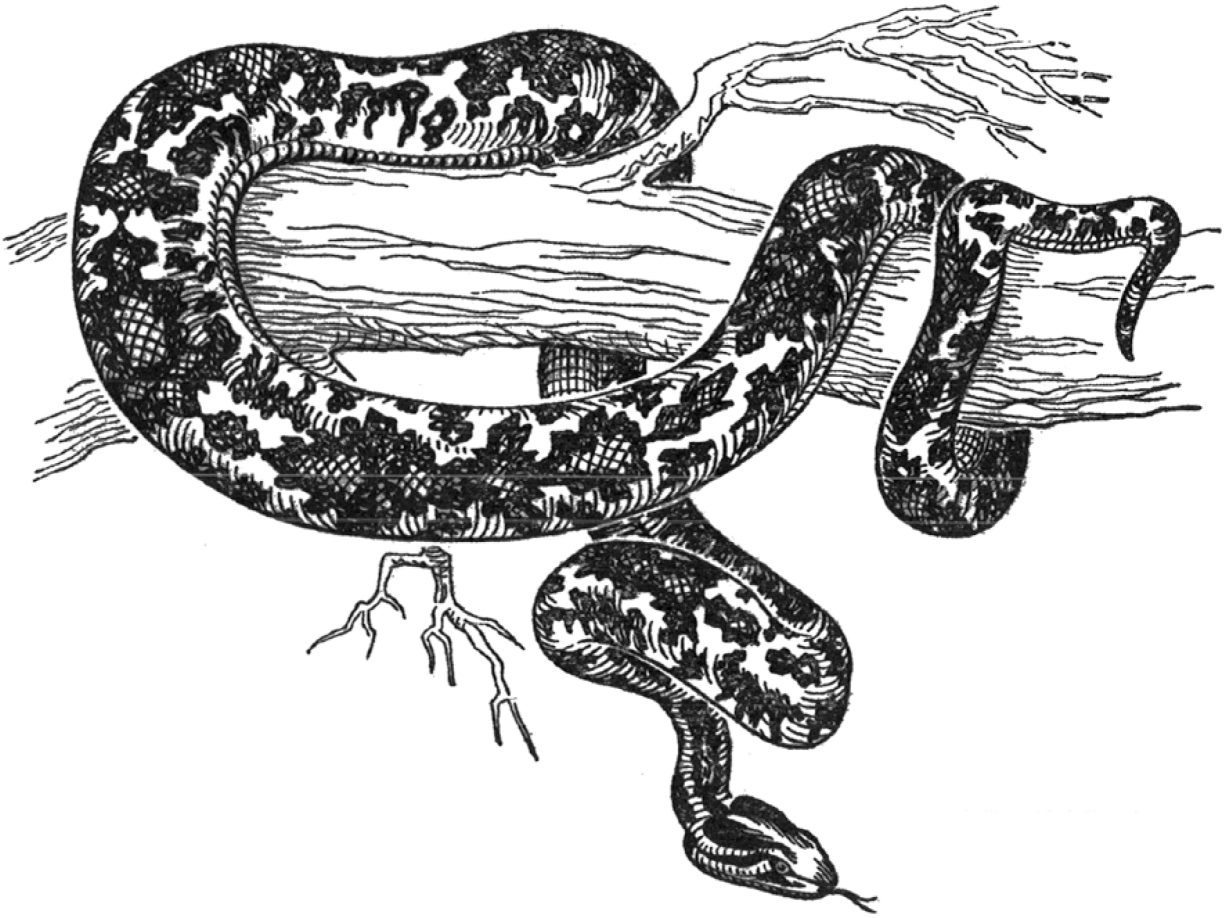
TICKS

36. ***Ants.*** The Red Ant makes its nest on the twigs of trees or shrubs, and is persistent in its biting attacks; other smaller biting ants have nests like earthy lumps, and it is wise to avoid trees with such apparent growths on them. Trees seen with leaves clumped together into small masses, or those on which ferns and orchids grow should also be avoided, as these will most probably harbour the biting ant.

ANTS

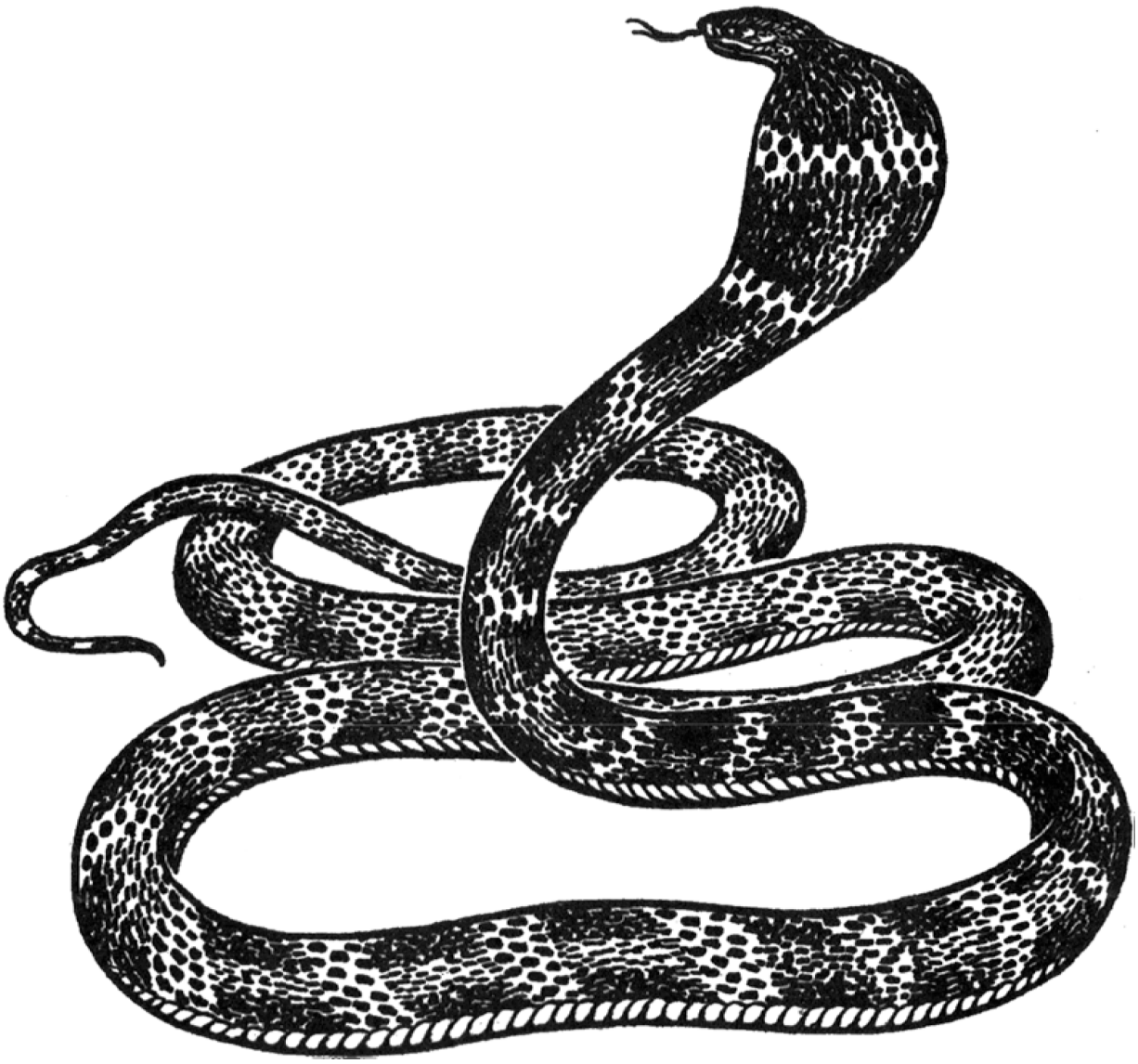
37. ***Snakes.*** Even the most deadly snakes prefer to glide away at the approach of man; but watch out for alarming one, or cornering it, particularly if following animal tracks, where they are found motionless on the ground, blending with their surroundings. Details of some of the snakes to be found in the jungle are given below:—

(*a*) ***Python.*** Length up to, but usually well below. 20 feet. A large constricting snake, sluggishly active by day and night. It prefers the forest, and may be found on the ground, up trees, or in the water. It is not of a timid nature, but though of very great strength, makes no attempt to avenge injury or offence. Has rarely been known to attack human beings.



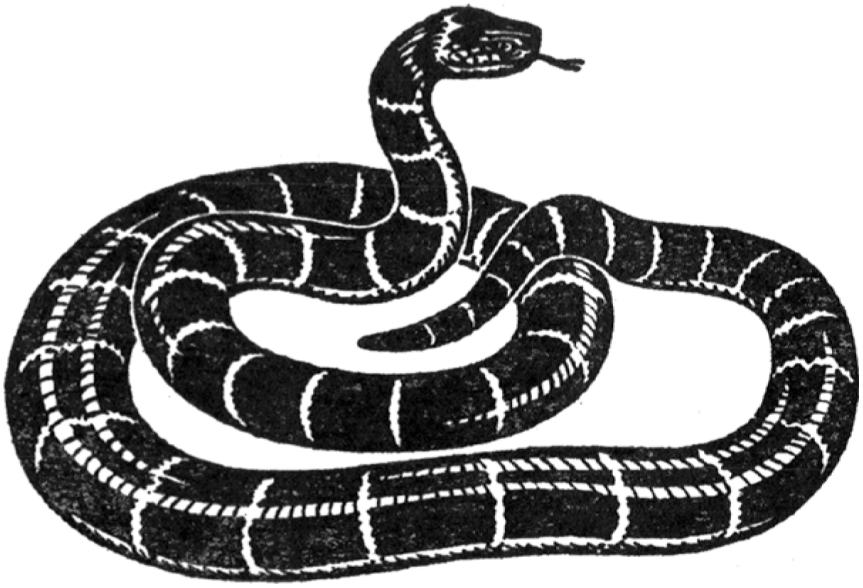
PYTHON

(*b*) ***Hamadryad or King Cobra.*** The largest of all poisonous snakes and is said to be the only one which will deliberately attack a man. It is olive or a yellowish brown in colour and may have a length of up to 18 feet. It is found in India, Malaya, South China and the Philippines. It is very aggressive and its bite is dangerous.



KING COBRA

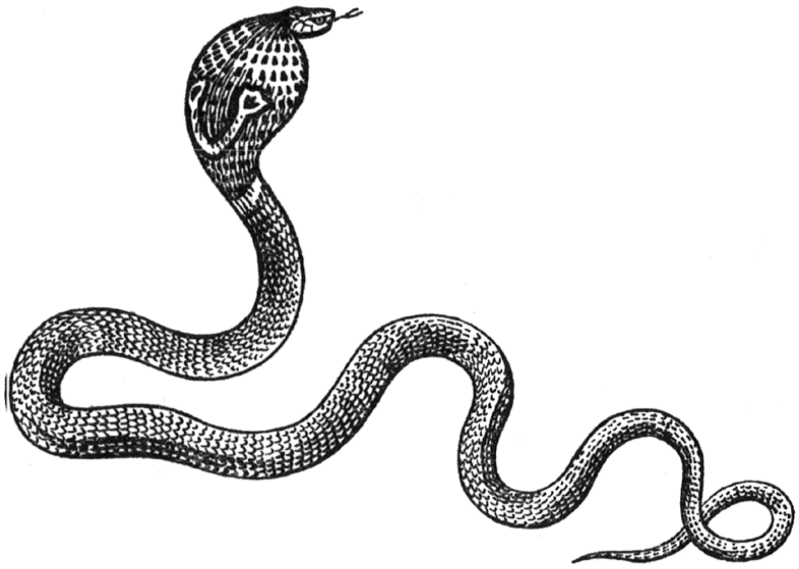
(*c*) ***Krait.*** Length about 3 feet, colour glistening black with narrow white cross bars. It lives in fields, grass, paddy and low scrub jungle and is found in India, Malaya and South China. Its bite is lethal, but it will seldom attack even under provocation.



KRAIT

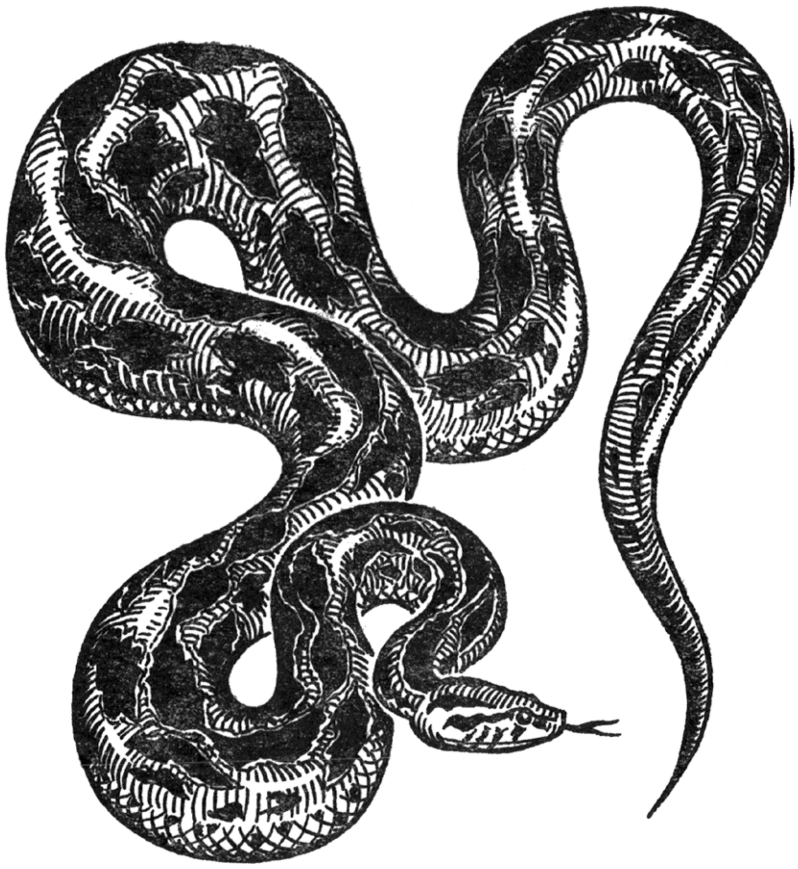
(*d*) ***Banded Krait.*** Colour black with broad yellow bands. Is found in the same countries as the ordinary krait, but prefers wet jungle areas. Not aggressive.

(*e*) ***Cobra.*** Length 5-6 feet. Its colour varies from pale brown to black. It has spectacle-like markings on the upper surface of the neck which are best seen when the hood is distended. It is most active by night, but will only attack man if disturbed or frightened. The bite is dangerous and may prove fatal in less than two hours. Found throughout Asia.



COBRA

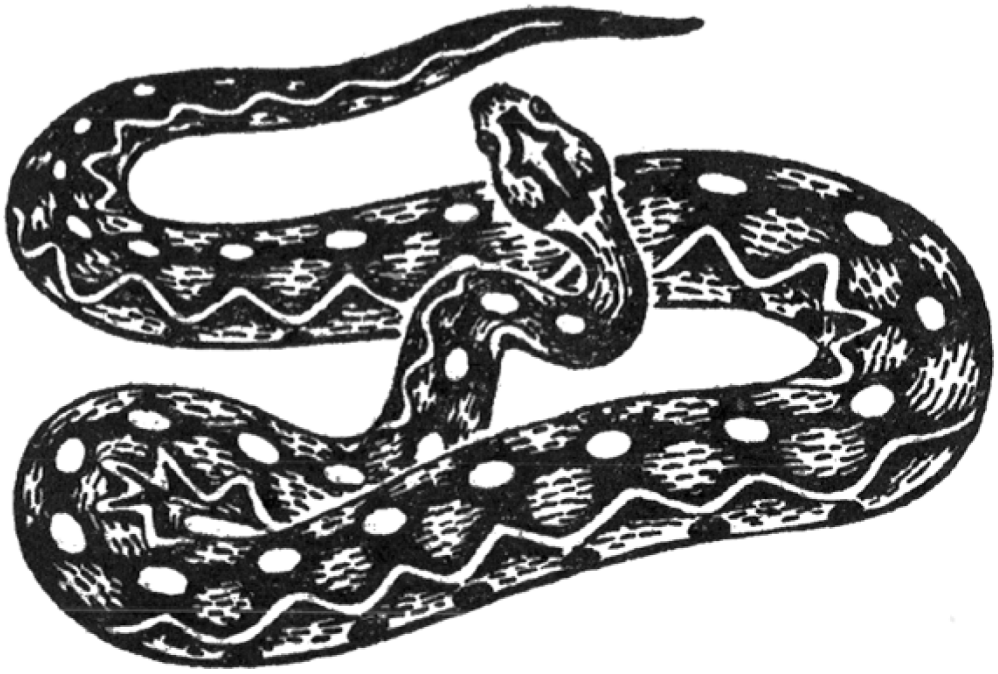
(*f*) ***Russells Viper or Tic-Polonga.*** Length up to 4 feet, dark brown in colour with three longitudinal series of black rings. Its underside is normally white or pale yellow but is sometimes mottled brown, the head is large and ugly and is covered with symmetrical dark markings. It is nocturnal in habit, usually sluggish but violent when roused. It is particularly dangerous in that, because of sluggish nature, it fails to get out of the way, and when attacking it can jump its own length. Its bite may be fatal in 24 hours. Found throughout South East Asia.



RUSSELLS VIPER

(*g*) ***Hump-nosed Viper.*** Length about 30 inches. Its habits are similar to those of the Russells Viper, but its bite is seldom fatal. Generally found under dead leaves and undergrowth.

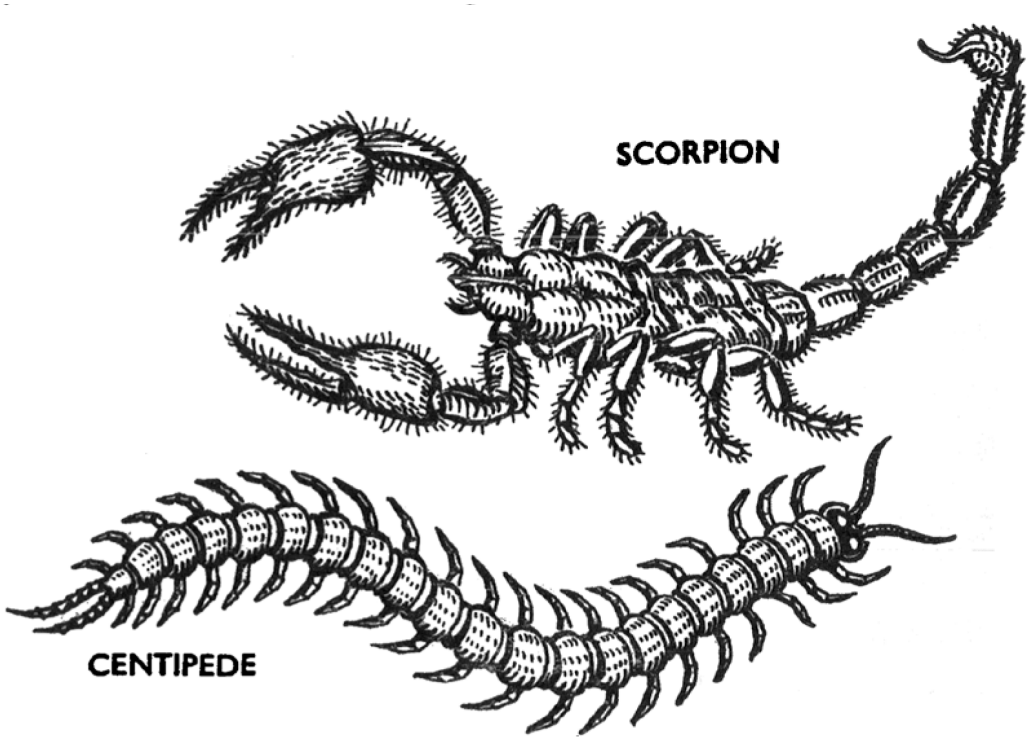
(*h*) ***Saw-Scaled Viper.*** Found in dry sandy areas where there is little vegetation. Its length is about 2 feet, and it is sandy yellow in colour with darker spots. It is aggressive and very poisonous. It may be found in the full blaze of the sun or beneath hot stones and in crannies heated by the sun. It has a habit of lying in a figure of eight with its head in the centre. Found in Syria, Persia and India.



SAW-SCALED VIPER

(*j*) ***Sea Snakes.*** Found around the tropical shores of the Pacific and Indian Oceans and in river estuaries. They do not frequent deep water. All sea snakes are poisonous but are seldom known to have attacked bathers. 2-4 feet long.

38. ***Scorpions and Centipedes.*** Although common in the tropics they are seldom seen in the open. They may be found under the bark of fallen tree trunks and under stones or rocks. Neither scorpion nor centipede will normally attack unless molested, but take care when handling rotten vegetation or when moving rocks. Inspect your boots before you put them on, as scorpions like to hide in discarded footwear.



39. ***Sandflies.*** Abundant by rivers, old forest clearings, and on sea shores. Take precautions as for mosquitoes.

40. ***Big Game.*** Most big game will avoid the scent and sound of man. If you travel noisily everything else will get out of your way. At night and in camp, keep a fire going to scare off wandering animals. Wild elephants may be inquisitive but will not approach a fire or light. Tigers are only dangerous when old and confirmed man-eaters. Avoid the banks of rivers, waterholes, and game trails by night and look out for crocodiles in the water at all times. Throwing stones is supposed to drive off crocodiles but you may not care to trust this.

JUNGLE TRAVEL

41. It is not generally possible to travel direct across country through the jungle. Your choice of paths will normally be restricted to streams and rivers, dry water courses, game trails, native paths, and along crests of ridges. These are the jungle highways and they have one thing in common —they run parallel to or follow the tilt of the land. Few jungle tracks cross

from one valley to another or traverse a series of crests; rather they run along the valleys or along the ridges separating the valleys. If there are no paths or streams, etc., and you have to cut across country, you may be able to make headway, but only at less than one mile per hour. Even a track 25° off your required bearing is better than no track at all. In jungle country you may find difficulty in reconciling the map and the compass. If in doubt, trust the compass, as jungle paths change position frequently and even rivers change their courses.

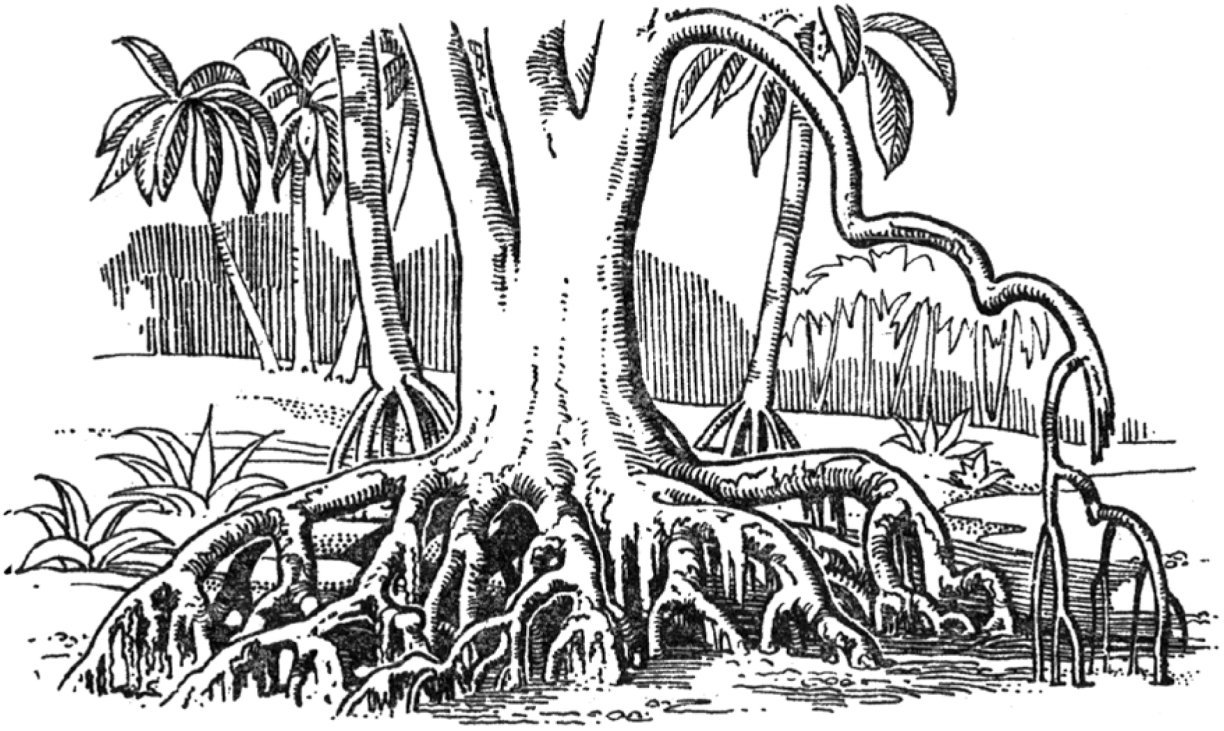
42. Tracks, game trails, streams, and ridges are animal highways at night, so keep clear of them in the hours of darkness.

43. To reach human habitation, follow down the course of a river or stream. Native villages are invariably sited on the banks and at the confluence of rivers which are the natives' trade routes.

44. If you wish to leave your camp site and later return to it, mark your trail. Blaze trees to show the white wood as you proceed, or cut off palm leaves and turn them upside-down to show their lighter undersides. Stones and broken branches will also mark a trail.

45. If you are without a compass, follow a stream or river and do not attempt to strike across country. If you have a compass, use it constantly and maintain direction by sighting on a landmark ahead on your required bearing. Make for this landmark and then consult the compass again.
46. If you wish to attract attention, do not wear yourself out by shouting. Hitting the trunk of a tall tree with a stout stick will make a drumming noise which carries much further than the voice.

47. In the lowlands trees with split roots will indicate swampy and perhaps tidal ground. Avoid all swamps, particularly mangrove swamps. The going is almost impossible and you are likely to get stuck half-way and have to turn back.



SPLIT ROOTS

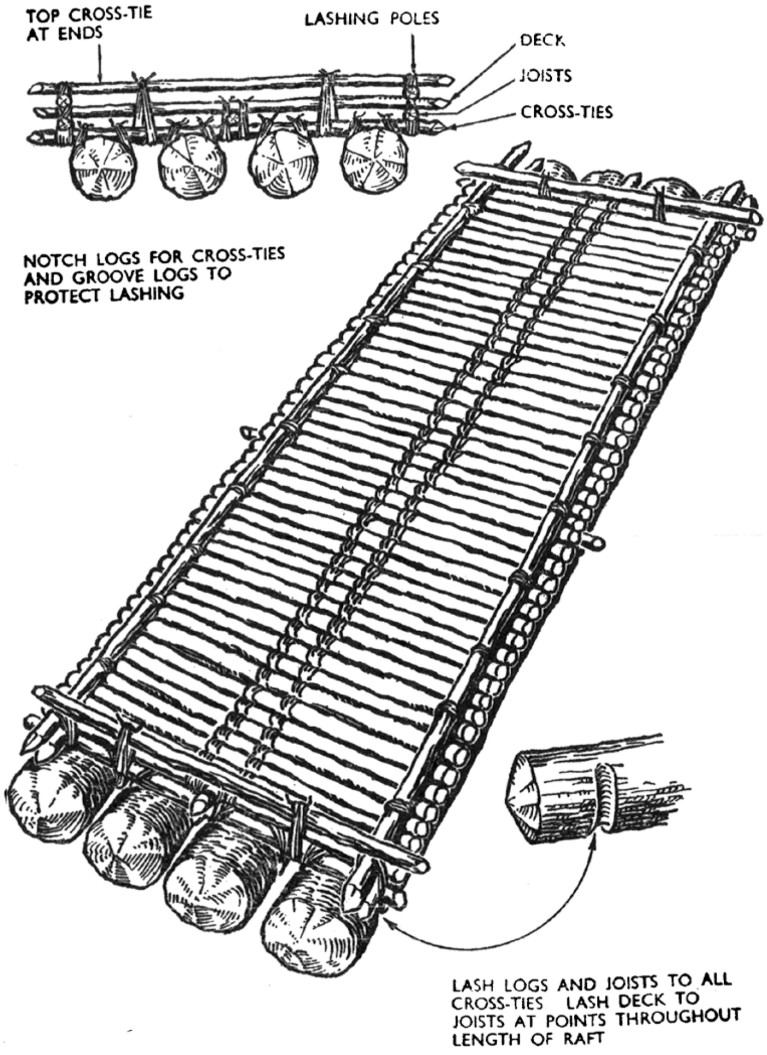
48. Never rush blindly forward. Whenever possible go slowly and deliberately, looking well ahead for hornets' nests, etc. Look out for snakes lying in the path. If you are in a party, travel in single file and have a "slasher" with a machete or knife in the van.

49. Do not tread or sit on rotten trunks or tree stumps, as they often harbour ticks. For the same reason avoid the wallows of large animals and wild pig. Never hit any dead or decaying vegetation without looking upwards. Dead branches may fall on you if you do not look.

50. In steep gullies or on hillsides there is often an accumulation of boulders and tree roots which become covered with mould and moss and form a false ground layer. Beware of breaking a leg by falling through this.

51. If you have no compass, you can judge direction by the sun, but you can only do so with accuracy in the morning and evening. At midday in the tropics the sun is so high that it is useless as a directional aid and you cannot find the North Point from your watch as you would do in England. Remember that the sun may be North or South at midday, depending on the time of year and your position relative to the equator. However, the sun always rises in the East and sets in the West. At night the Southern Cross gives a good indication of South.

52. For crossing streams and rivers make a raft of bamboo or some other light wood. Palm logs and jungle hard-woods do not float. If anyone has to swim across a river, throw stones in the stream and splash about to scare off crocodiles.


TOP CROSS-TIE AT ENDS
LASHING POLES
DECK
JOISTS
CROSS-TIES
NOTCH LOGS FOR CROSS-TIES AND GROOVE LOGS TO PROTECT LASHING
LASH LOGS AND JOISTS TO ALL CROSS-TIES LASH DECK TO JOISTS AT POINTS THROUGHOUT LENGTH OF RAFT

LOG RAFT

53. Take things easily, giving yourself a break every hour or thereabouts, depending on the type of country. This break of five or ten minutes should be utilized to discuss your route, take refreshment, to de-leech and to repair clothing and equipment. Make an early start and strike camp early so that by sundown the camp is organized and all are ready to settle for the night.
54. Take all normal precautions to keep yourself fit and see that other members of the party do the same. Scratches and bites should be attended to right away, and make sure that due care and attention is given to the feet. This involves taking off all footwear at night and, where possible, washing and drying socks and stockings. Check footwear in the morning for scorpions by tapping them on the ground. If you find you are getting

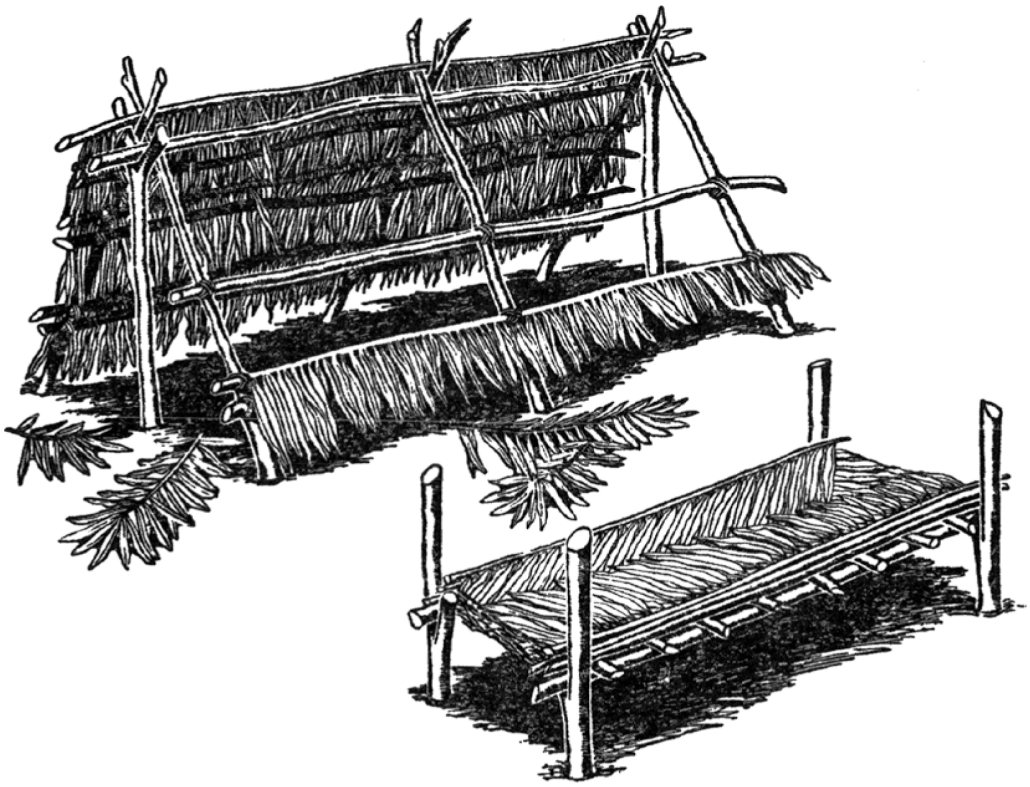
blisters on your feet, stop at once and put a dressing over the blister. Do not wait until the blister becomes unbearable.

CAMPING SITES

55. The requirements of an ideal camp site are as follows:—
(*a*) Proximity to water and food.
(*b*) Solid ground free from mud.
(*c*) Freedom from dead and decaying vegetation and insects.
(*d*) Freedom from overhanging branches, or from coconuts overhead.
(*e*) Natural protection from weather and animal life.
(*f*) Concealment in wartime.

56. Unless one is able to keep dry and free from insects and other irritants, there will be little rest during nights spent in the jungle: so take some care over the selection of the camp site. Make your decision in good time so that the site may be made safe and comfortable before nightfall. Do not, however, insist on finding a place which meets all the above requirements or you are likely to search all night.

57. Start off by clearing away all dead and rotting vegetation, as such rubbish encourages ticks, ants, leeches, etc., and as soon as possible light a fire, as the smoke will drive away those irritating insects, quite apart from being ready to cook and heat water later on, as required. Arrange for a supply of bamboo, if it is available, as it will be found invaluable for cooking and boiling water.
58. Make yourself a bed, either by utilizing the parachute canopy you have brought with you or by collecting twigs and small branches from the trees, covering a cleared area of ground with them, and then adding a further covering of leaves. This will ensure your having a good night’s rest, and also insulation against ground chill and dampness. You are likely to be very cold at night, so don’t discard blankets and heavy clothes if you have them with you.



PALM BED AND SHELTER

59. Your fire will produce a certain amount of ash, which should be removed from the fire, and spread in an unbroken line around the camp site, thus ensuring no intrusion from the innumerable insects to be found crawling around on the floor of the jungle.

DON'T camp in river beds, though they might look clear and dry, as a storm in the hills might flood the river in a few hours.

DON'T be too concerned about the proximity of water. If making camp for an indefinite period, consider the laying-on of a water supply by using sections of split bamboo in the form of guttering, having tapped the stream at a point further up from the camp site.

DON'T overlook the necessity of making sanitary arrangements, as this will avoid risk of developing one of the numerous diseases affecting the intestines. See that all refuse is deposited well clear of the camp, and buried if possible. (See First Aid and Personal Hygiene.)

CAMPING SITE

FIRES

60. On the assumption that you have the means to kindle a fire, the following points should be borne in mind:—

(*a*) Use judgment in the selection of a fire site. Pick a spot where there is no danger of the fire spreading; dry and sheltered if possible. During the wet season find a dry spot under a leaning tree or similar shelter.

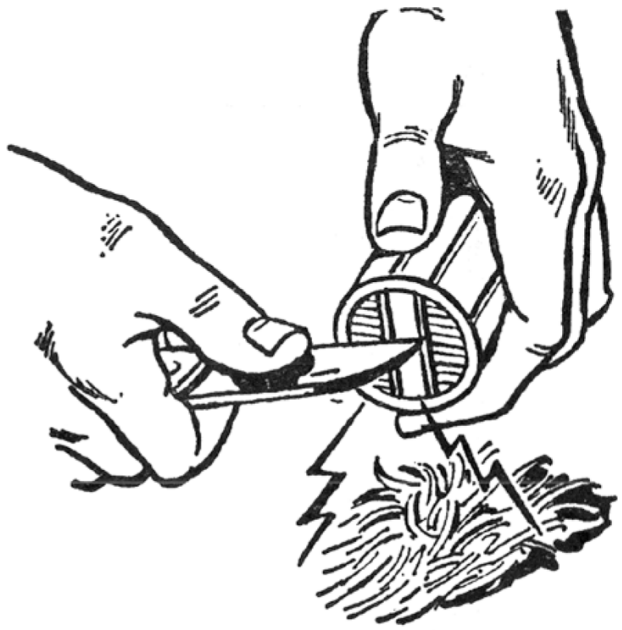
(*b*) Use dry fuel, which may consist of dry grasses or plant stems, dry leaves or bark from trees. Dead wood from trees, and pieces found in rotting trunks or fallen branches will be found to be dry even in the wet season. Do not use wet bamboo as it may explode in the fire and throw out dangerous splinters.

(*c*) Have a good supply of firewood and kindling available before starting a fire, and having got some of the smaller pieces of wood to burn, add the others and build the fire up, rather than attempt to start with a large one.

61. A fire, quite apart from giving a little moral comfort, discourages the approach of any wild animal, and also smokes away all forms of insect life. Remember when leaving camp to ensure that the fire has been properly extinguished, either by watering thoroughly, or spreading the ashes and stamping them out. In dry country, prone to forest fires, use both methods and travel on with a clear conscience.

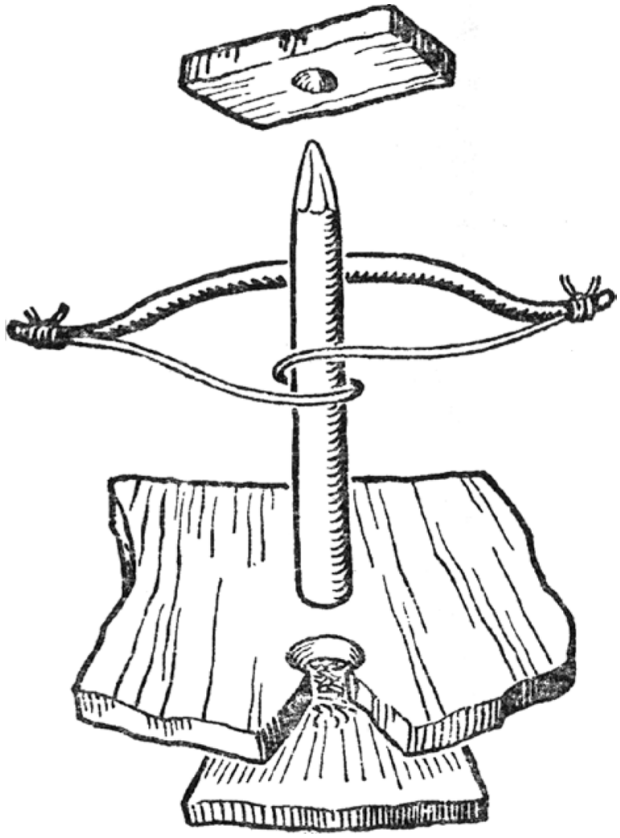
Methods of Kindling

62. Although one reads of various methods of kindling a fire, apart from using matches, most of these will be found rather unsatisfactory. Rubbing pieces of wood together, or producing a spark from two stones or flints is all very well, but in practice it will not produce results in the hands of the inexperienced. It is, however, most essential for the “jungle hiker” to conserve his waterproof matches, as, rather obviously, these are going to be the easiest means of producing fire.



FLINT

63. Another satisfactory way is by using a piece of magnifying glass, or lens; often termed a “sun-glass”. Aircrew flying over desolate tropical country should always see that they have one amongst the various “odds and ends” they choose to carry with them.

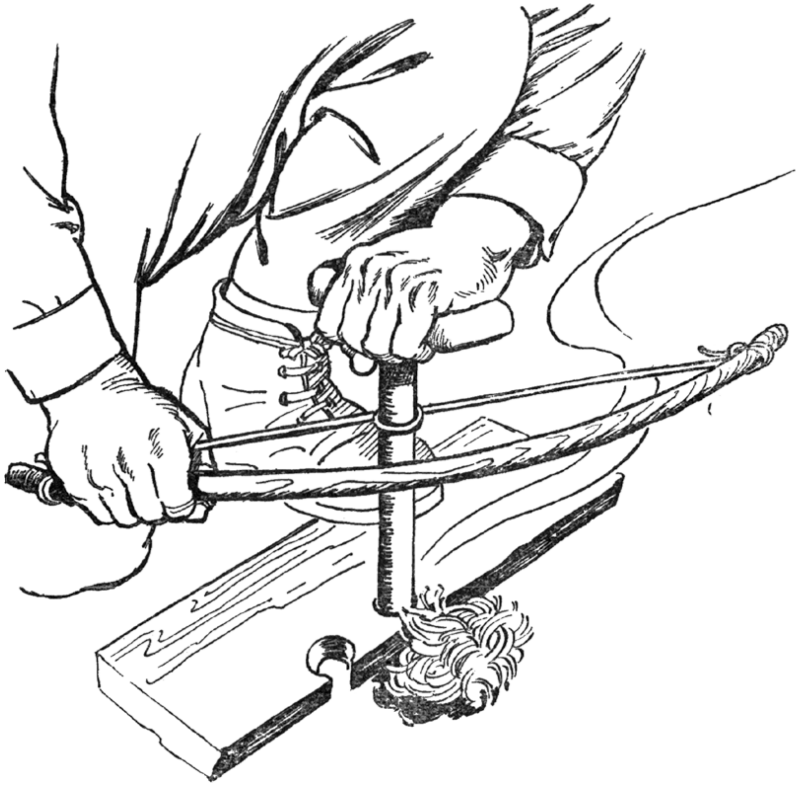


FIRE BOW

64. If faced with the necessity of producing flame without matches first of all see that you have everything ready to start a fire, such as plenty of dry small wood and kindling, and choose a suitable spot. Then go in search of a piece of straight dry wood, well seasoned; such wood might be found amongst dead trees; pick a soft wood in preference to a hard wood, and use one of the following methods:—

(*a*) ***Fire, with Bow and Drill (see illustration).*** Draw the bow backwards and forwards, causing the drill to spin in its hole, the action should be slow full strokes at the beginning, and working up to a fast stroke as the smoke begins to rise. Once smoke has been seen to come from the hole in the block a spark should be

found large enough to start a fire. Take the block, and add a little tinder, blowing gently—you should then get a flame; but be sure to build up the fire from a small start, otherwise it will most likely be smothered, and go out, when the whole procedure will have to be done again.



BOW AND DRILL METHOD OF MAKING FIRE

(*b*) ***Fire Thong.*** Obtain a length of dry rattan, and draw it smartly across a soft dry piece of wood. Have the kindling underneath, ready to catch the embers as they drop.

(*c*) ***The Fire-Saw.*** This is another simple method, but requiring rather more physical strength and stamina than the other methods. It is just a question of drawing one piece of wood across another. A piece of split bamboo or soft wood will serve as one piece, using a sawing motion across another section of wood.

RUBBING TWO PIECES OF WOOD TOGETHER

Methods of Cooking

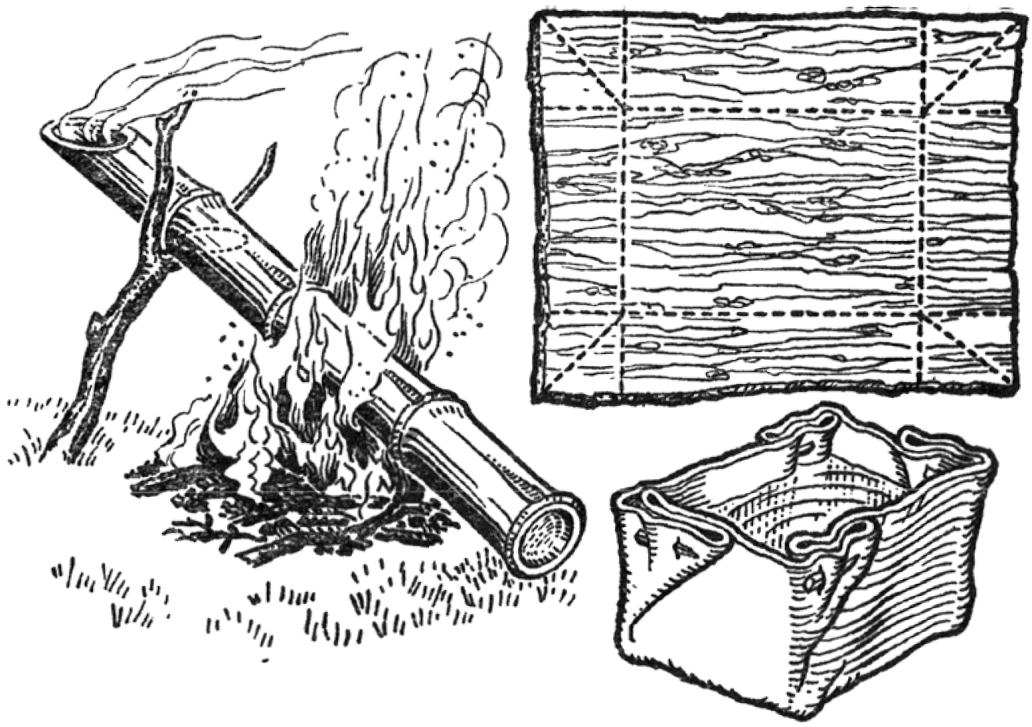
65. Food is generally more palatable and safer to eat when cooked than when eaten in its raw state, and there is no reason why anyone stranded in tropical country shouldn’t have a hot cooked meal. Probably the most simple method is by “broiling” over a fire; all that is required is the fire and some means of supporting the food. This method can be used to great advantage with fish, and small joints, or animals.

66. Yams, potatoes, and some other roots can be placed immediately in the fire, and left until they feel tender. Clean, and remove the skin, and the meal is ready for serving.

67. The gipsy method of cooking certain types of meat is another simple, yet very effective, method. This involves the collection of mud, or clay; the food to be cooked is covered with it and placed in the fire. When ready remove from the fire and when the clay is broken open, the food will be found clean, and ready to eat. In the case of the porcupine, this method also removes all his quills with the greatest of ease.

68. Boiling food is always a good stand-by, and it is generally a question of finding a container in which to boil the water. This should not cause any difficulty, particularly if in the vicinity of a jungle stream or river, as a selection of bamboo will, no doubt, be found along its banks. There are two simple methods of boiling with the aid of bamboo, which incidentally will last for only two or three meals, before the wood becomes charred and leaks. If a considerable quantity of water is required, take a length of bamboo, perforate each water-tight section, except the bottom one, suspend over the fire, using a forked stick, in the manner of the illustration.

69. If only a small quantity of water is required to boil some fruits or vegetables, etc., take one section of bamboo, cut a hole in the top, and suspend over the fire by means of two horizontal sticks, or two pieces of jungle vine or rattan.



BOILING WATER

70. If bamboo is not available make a vessel from fibrous barks or leaves. A container thus made will not burn below the water-line; moisten the area above the water-line to reduce the risk of the container burning from the top. Keep the fire small, and the flames low, and there should be little difficulty in producing the required results.

Suggested Methods of Cooking various Types of Wild Food

71. ***Fruits.*** Boil succulent fruits, and bake or roast the thick-skinned and tougher variety.

72. ***Potherbs* (*vegetables*).** These are best boiled. In some cases, it may be necessary to boil in two or three changes of water in order to remove undesirable acids, etc.

73. ***Roots.*** Either bake, roast, or boil; the former is probably the easiest of the three methods in this case.

74. ***Small Game.*** These may be cooked whole or in part; if uncertain as to the quality of the meat, boil first, then roast or broil.

75. ***Fish.*** All methods of cooking are suitable for fish meat, and remember that most of the fresh water fishes should be boiled, before eating or cooking by any other method.

76. ***Reptiles.*** The smaller varieties can be toasted over a fire, but such things as snakes, eels, and turtles are best boiled. In the case of the latter, when cooked the shell will come away from the meat; it makes a good meal if boiled in vegetables, with the meat cut up. Serve as a stew or soup.

77. ***Crustaceans.*** The simplest method of cooking these is by boiling. They require little cooking, but will spoil very quickly after being caught.

SALT

78. This is required in cooking, and to ensure the proper functioning of the human body. It can be obtained from sea water, also the ashes of burned nipa palm boughs, hickory, and one or two other plants contain salt that can be dissolved out in water. The salt remaining after evaporation is a dark gritty substance. The salt tablets from the Tropical First Aid outfit can be used for cooking.

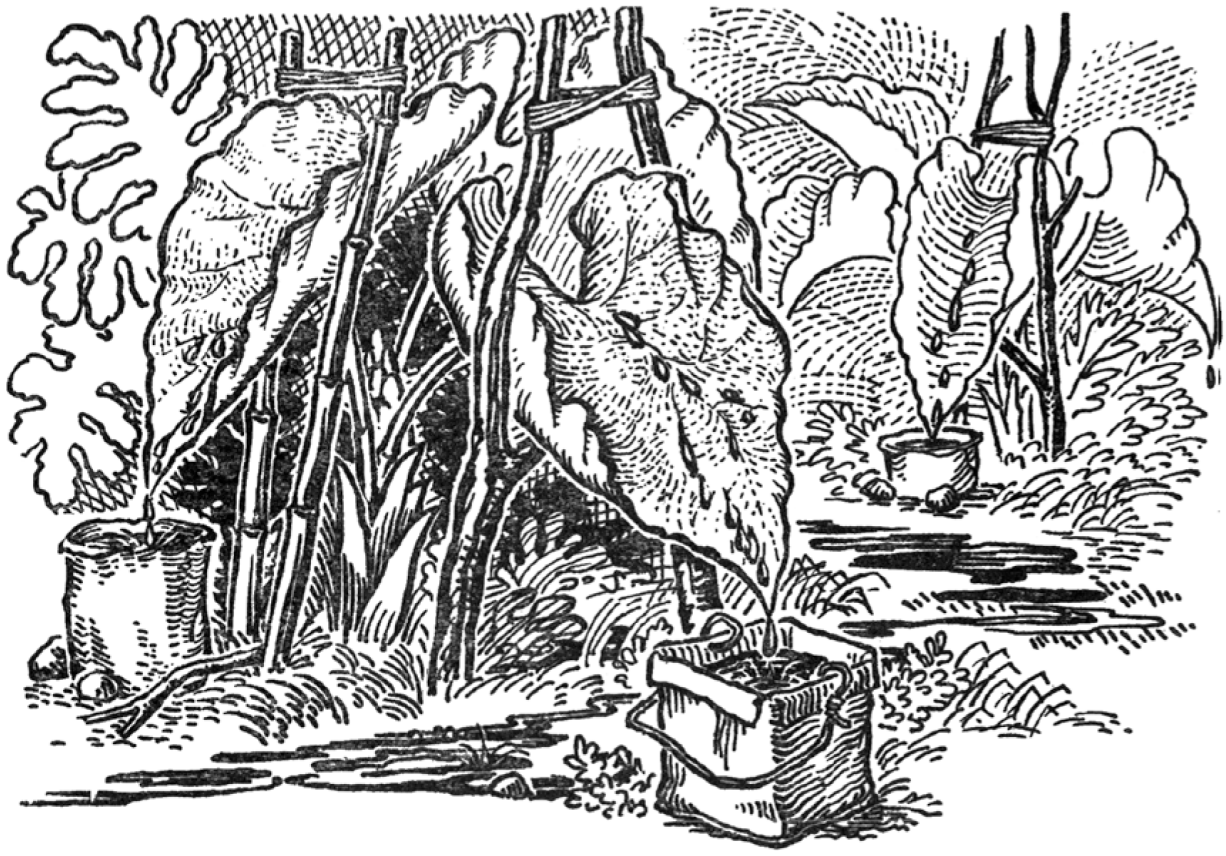
WATER

79. Survival is more dependent on a supply of drinking water than on any other factor. Your emergency rations are no good to you unless you have the drinking water to go with them. Remember that with water alone one can expect to survive for about three weeks, but without water the average man will last no longer than two to five days.

80. In tropical forest, the availability of water is not so great a problem as its purity, and the table given later in this section shows where water can be obtained, and which of the sources should be purified before drinking. All non-flowing water found on the surface should be purified, and there are a number of alternative methods of doing this, as shown:—

(*a*) Use the halazone tablets in the Survival Kits, and allow to stand for 10-15 minutes.

(*b*) Use two or three drops of iodine to one quart of water, and allow to stand for 30 minutes.
(*c*) A few grains of permanganate of potash to one quart of water, and allow to stand for 30 minutes.
(*d*) Make a container from bamboo, if nothing else is available, and boil for at least three minutes.



RAIN TRAP

81. Numerous jungle plants have natural receptacles in which water will be found; though in certain cases, such as the cups of the pitcher plants, the water will be foul with decaying insects and quite impossible to drink. One of your most plentiful sources of water is in the jungle vines, or the rattans, which hang suspended amongst the trees and jungle vegetation. By cutting a length of about four feet, from the lower portion of the vine, the jungle hiker will obtain a quantity of cool refreshing water, in no need of purification. A word of warning, however; look out for those vines giving a milky or dark-coloured sap, as they should be avoided.

82. When drinking from a jungle stream, if you consider the water pure and fit for drinking, don't drink direct from the surface, but cup your hands, or use a drinking mug of some sort, so that you can see what you are drinking, and avoid swallowing such things as leeches, or other small water life. If you find a plentiful water supply, drink as much as you can, as the body can store plenty of water for future use.

83. At times, it is often found necessary to use for cooking and drinking, water obtained from animal watering places, or large rivers, the water being muddy, and cloudy. This is not necessarily dangerous, and this water can be purified by one of the methods mentioned above. It is better to filter this water, and endeavour to clear it; this can be done by allowing it to stand for a while, overnight perhaps, with a cover on the container. Then, to filter, use a sand-filled cloth, or a bamboo stem, filled with leaves or grass.

84. ***Sources of Water in Tropical Forests.*** Fresh water, not in need of purification:—

(*a*) ***Rain.*** Build a rain trap from large leaves, with framework made up from bamboo or branches.

(*b*) ***Jungle Vines (and Rattans).*** Select the lower loop of any vine, and cut out a length of four or five feet, from which drinkable water may be drained.

(*c*) ***Streams.*** All fast flowing streams, having a mixed sandy and stone bed, provide clean water. If there is no sign of animal deposits, or sewage within half-a-mile up stream, this water will also be pure, and ready for drinking.

(*d*) ***Plants.*** During the monsoon or rainy season water can be collected from natural receptacles found on various plants. This will be fresh rain water, and fit for human consumption.

(*e*) ***Bamboo.*** In the base of large bamboo stems will be found drinking water. It is not possible to guarantee finding water from this source on every occasion.

(*f*) ***Coconuts.*** In the green unripe coconut will be found a very good substitute for fresh water, *i.e.* "coconut milk". One nut may contain as much as two pints of this delicious cold fluid. Do not drink the "milk" from the ripe, or fallen coconuts.

85. ***Sources of Water which should be Purified before Drinking***

(*a*) ***Water Holes.*** Water found here will probably be muddy, and with pieces of rotten vegetation in it, so filter it first, then allow to stand for a few hours, filter again, then purify by one of the methods suggested at para. 80.

(*b*) ***Digging.*** Treat water as for (*a*) above. If on the seashore, dig a small hole a few yards above high tide, and as soon as you find water collecting, stop digging. Water collected in this way should be fairly free from salt, the fresh water floating on the top of salt water, hence don't go too deep. The water obtained in this way may taste slightly brackish, but will be safe to drink. If very strong, filter it a few times, or try again further up the fore-shore.

(*c*) ***Stagnant Water.*** This is not necessarily infected, but in order to make sure, filter it, then purify. Stagnant water may be found in small pools, amongst rocks, dead tree-stumps, etc.

(*d*) ***Large Rivers.*** This water will be muddy and probably infected, so treat as for water holes.

SOLID FOOD

86. Plant food alone is not likely to keep you alive indefinitely unless you are prepared to spend all day hunting for it. It will, however, prove a welcome addition to other food and will keep starvation away for several days. There are a number of potential food plants to be found throughout the jungle, but the most common, found in abundance in the tropics, are mentioned here. These are selected because of their abundance, simplicity of preparation for eating, and comparative ease with which they can be recognized.

87. In addition, it is to be strongly recommended to those stationed in tropical areas that they obtain the assistance of a native guide, and arrange for an instructional walk through a typical part of that country over which they operate, or visit the nearest botanical gardens.

88. There is no need to worry unduly about the effects of poisonous plants, for though a few might be considered highly dangerous, the greater number will most likely cause you to be indisposed for a matter of days. With

reasonable care, and by taking the normal precautions when taking strange foods, your troubles should be small. Should you at any time be uncertain of the plant you wish to try, the following points may be of guidance:—

(*a*) Eat sparingly of any strange plant, until you can be quite certain as to the reaction, if any, it might have on you.

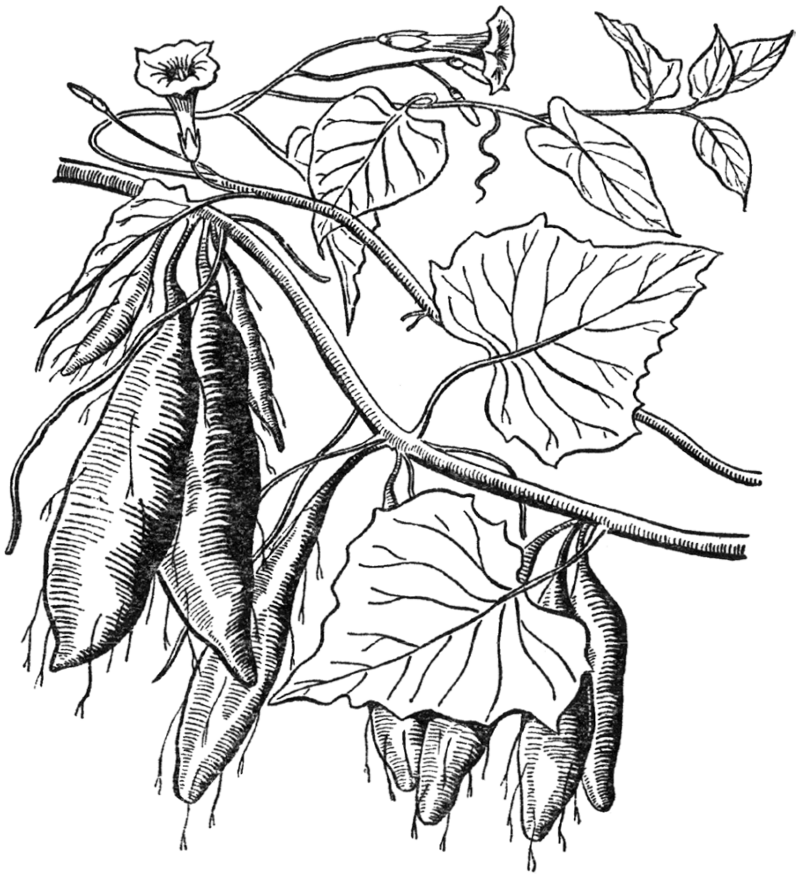
(*b*) Avoid all those things which are unpleasant to the taste, those which are bitter, or acid, etc.

(*c*) Avoid those plants, with one or two special exceptions, which give a milky or soapy sap.

(*d*) If in doubt, endeavour to see what the monkey thinks of the food, for you can always rely on him deciding whether plants are fit to eat.

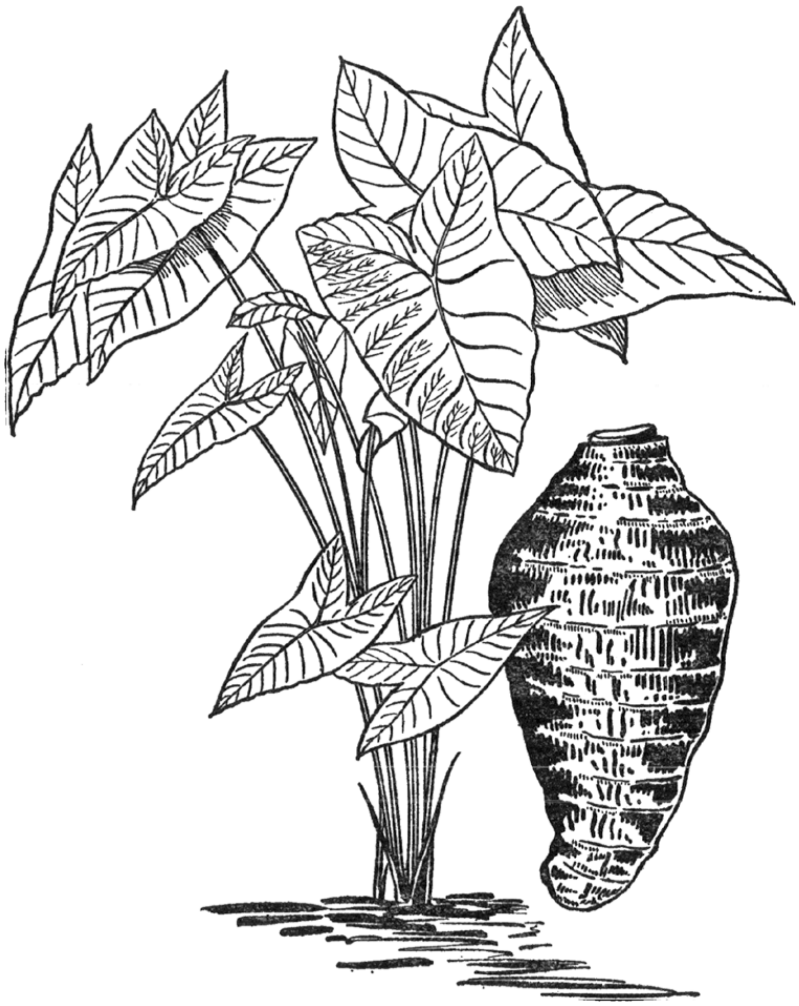
Selected Foods

89. ***Sweet Potatoes.*** Have a vine-like growth, with leaves, and flowers that resemble those of the “morning glory”. The potatoes may be eaten raw or cooked, the latter by placing in a ground oven, or in the base of a fire after which clean them, and peel. In addition to the potato, the young shoots and leaves are delicious when boiled, and make an excellent substitute for spinach.



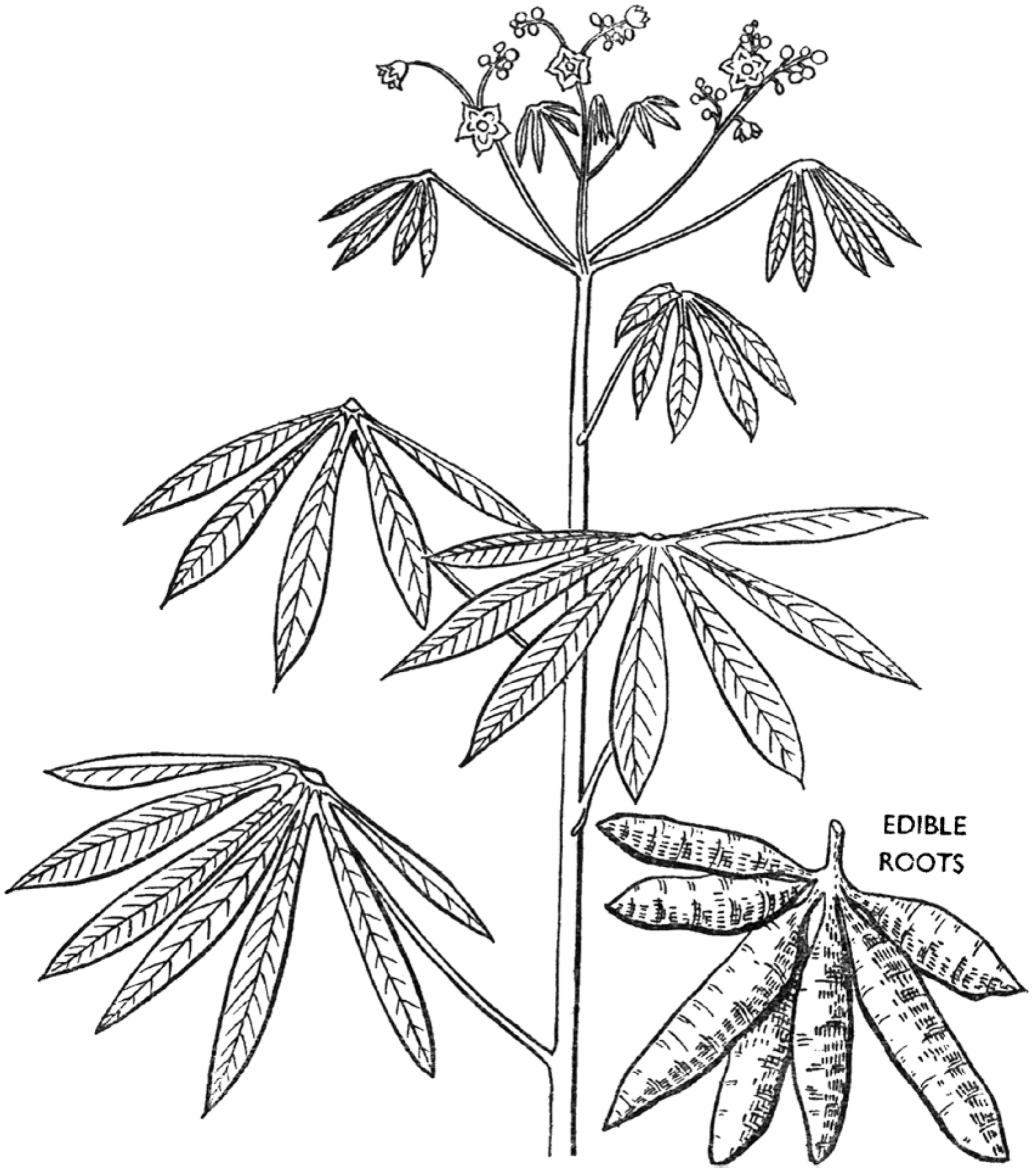
SWEET POTATO

90. ***Taro.*** A plant two or three feet in length, with a large heart-shaped leaf, resembling “elephant ears”. Taro has thick potato-like roots which differ in size, according to variety. This plant provides one of the natives’ staple foods. The roots and young leaves and stalks are all edible, but must be cooked, by boiling or roasting, which are generally the simplest of methods. After cooking, the roots may be peeled, then mashed into a doughy-like mass, with the addition of a little water. This may be preserved, if required, for a few days, by wrapping in leaves.



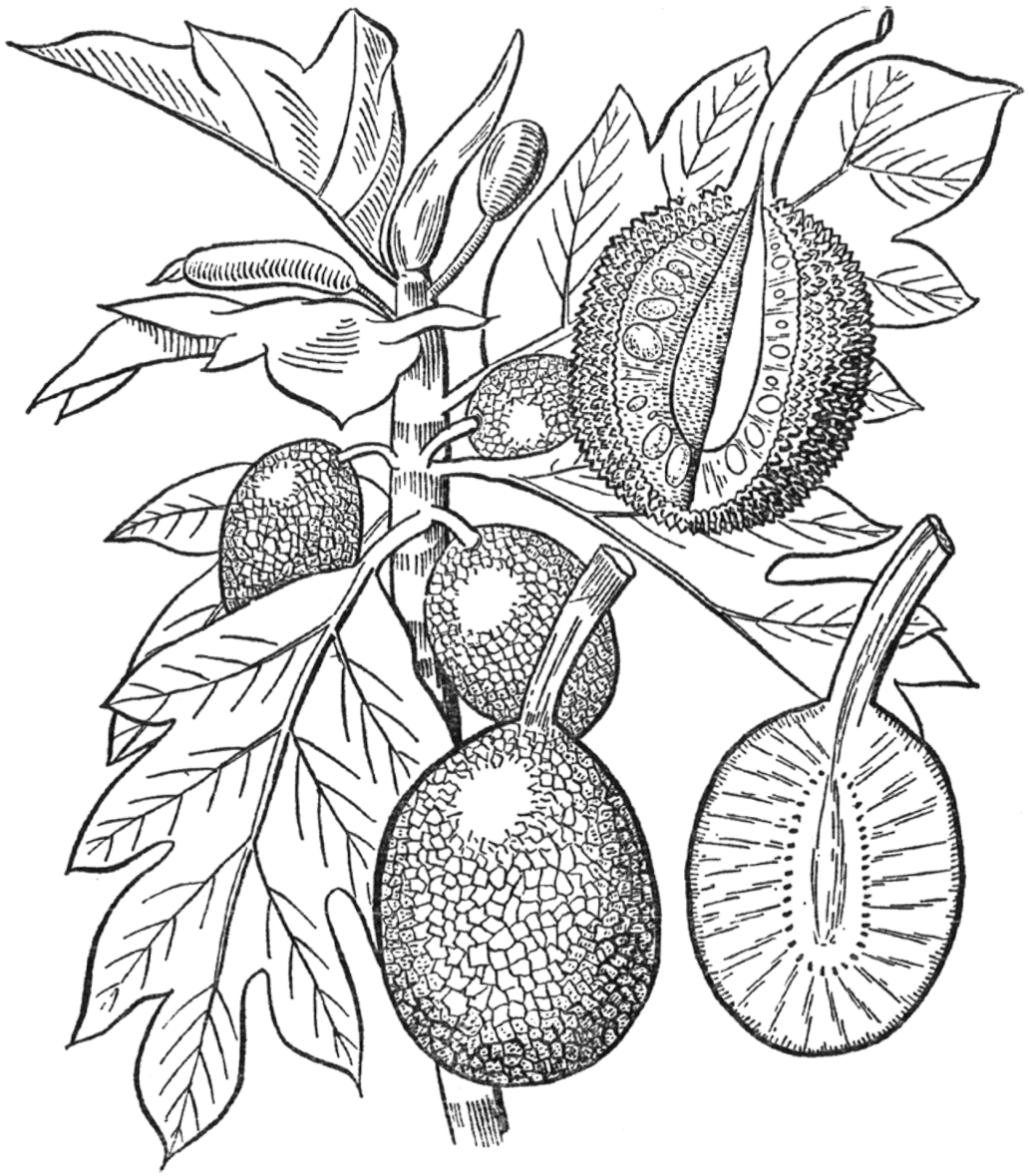
TARO

91. ***Tapioca.*** Known as cassava or manico. The plant is shrubby and three to seven feet high, with large tuberous roots, this being the edible portion, which vary in size from six inches to as much as two feet. There are two basic types, the sweet type, and the bitter: and one can only be distinguished from the other by the taste. Avoid the bitter type, unless it can be cooked, as it is highly poisonous, containing the basis of the deadly hydrocyanic acid. To cook the bitter type, grate or mash the roots into pulp, squeeze out the juice, and make the remaining “dough” into cakes, which can then be baked in the ordinary way.



TAPIOCA

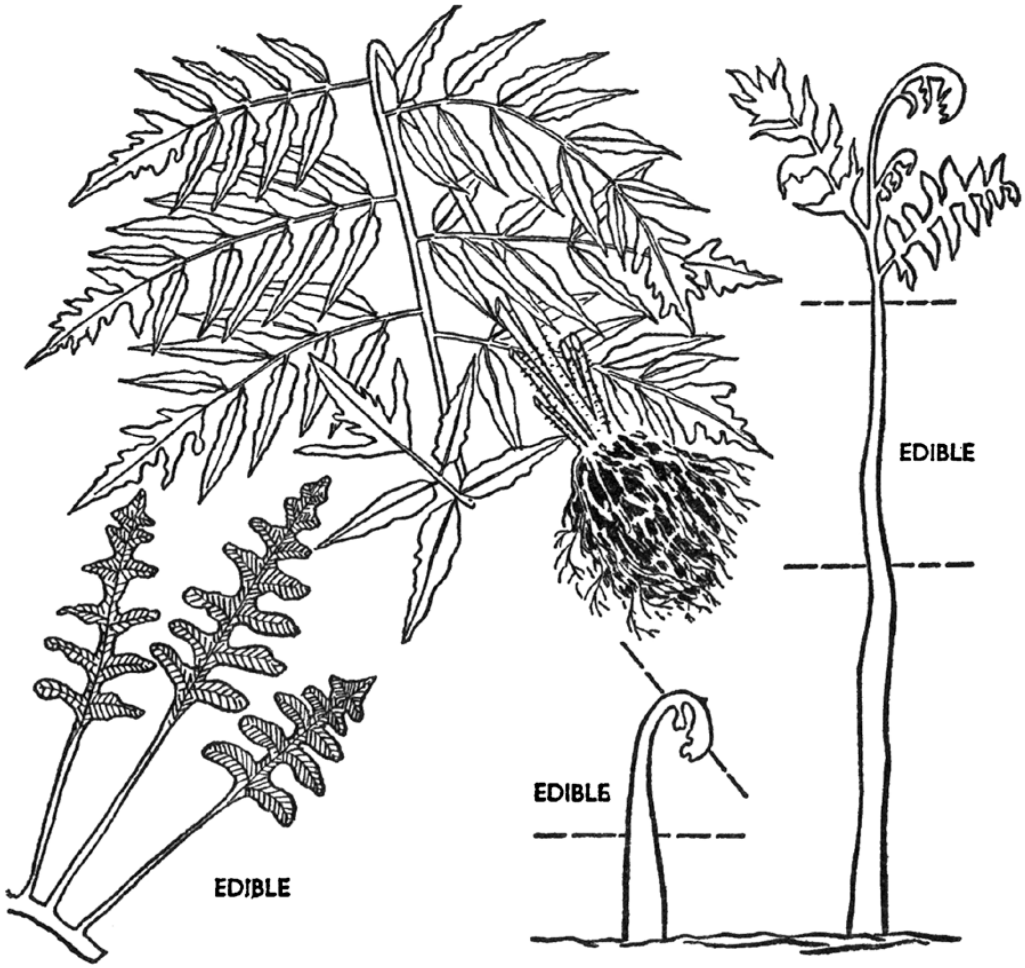
92. ***Breadfruit.*** Should always be cooked before eating. The most practical way is to bake the entire fruit in hot embers for half-an-hour or so, then peel off the skin before serving. It can also be boiled, baked, or cut into slices and fried. To preserve, boil first, then cut into strips, and allow to dry-out in the sun. When required these slices can be served without any further preparation. The seeds may also be eaten if boiled or roasted.



BREADFRUIT

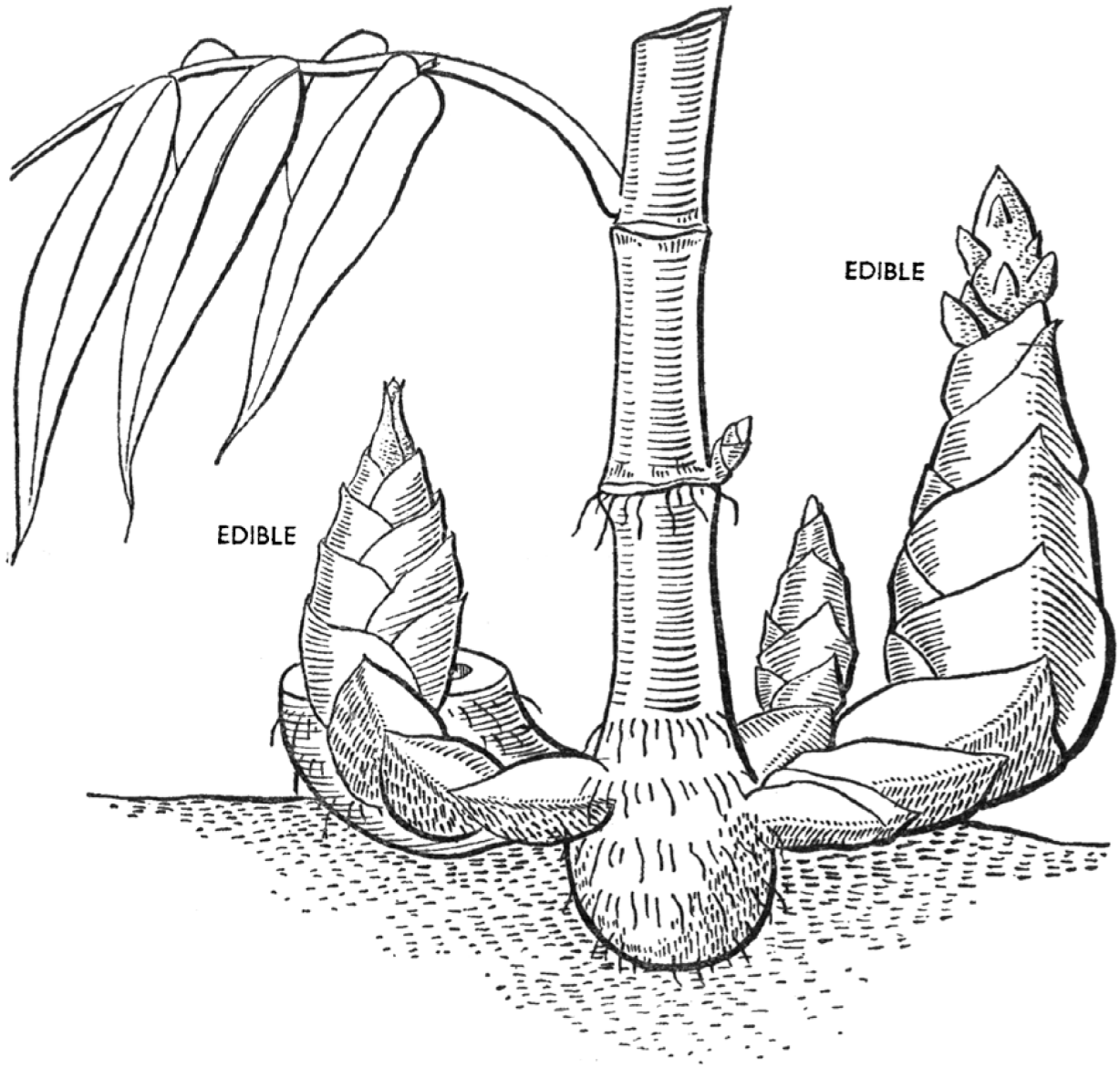
93. ***Ferns.*** Several varieties are abundant in many areas, and are to be found in marshes, swamps, along water courses, and other camp shady places. The tree ferns will be found throughout the forests. The tips and shoots of most of the ferns are good food, raw or cooked, and because of their widespread distribution, their accessibility, and ease of recognition, may well serve as a most important source of diet. Ferns, like all the food to be found in the jungle, should be taken in small quantities during the first few days, as the change in the form of diet may have an adverse effect on the stomach and intestines and cause diarrhoea. Though ferns are so readily available, they

are not particularly nourishing, and if other forms of food can be found, it would be well to vary the diet.



FERNS

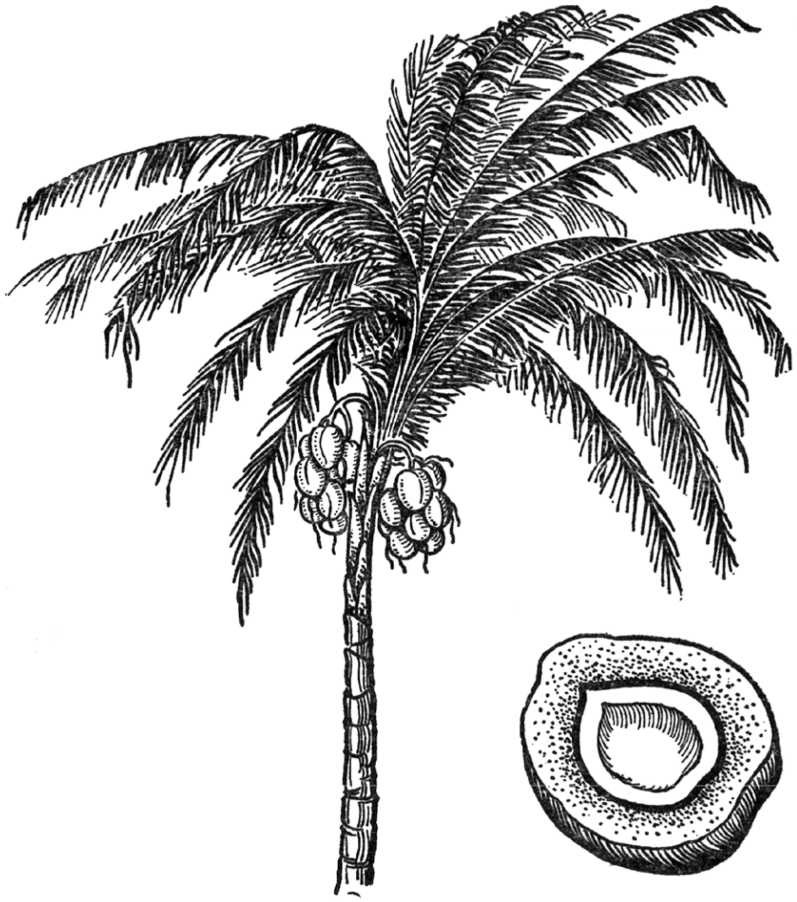
94. ***Bamboo.*** Here is a good emergency food, which is familiar to everyone, and is widely distributed throughout all tropical climates. The young shoots, up to a foot or so in height, can be eaten raw, but are more palatable if cooked. See that the fine black hairs along the edges of the leaves of the small shoot are removed before cooking, as they are poisonous.



BAMBOO

95. ***Coconuts.*** These contain, not only good drink, but also good food. First there is the meat inside the nut itself, which makes good eating, and also can be made to yield coconut oil, which is a useful preventative for sunburn. In addition there is the palm “cabbage”. The cabbage is found in the top of the palm, inside the sheath from which the leaves protrude, and may be eaten raw, boiled, or roasted. Where it tastes pleasant it makes an excellent vegetable though some varieties may be bitter. The coconut is an excellent food and palm trees are numerous, but getting the nuts is not quite so easy; healthy coconuts do not fall off trees, but have to be plucked by

hand. If you can get a native to go up the tree, so much the better; if not pick a small and sloping tree and climb up as best you can. When you have got the coconut, the next problem is to open it. The husk may be cut away with a machete, but the best way is to place a stout pointed stick in the ground point uppermost and bang down the coconut on the spike. When you have got a split in the husk, use the spike as a lever to prize it off; once the husk is removed it is easy to break open the inner shell.



COCONUTS

BREAKING COCONUTS

96. ***Seaweeds***. All forms of seaweed are edible; oddly enough they are not particularly salty in flavour, and their water content is fairly fresh. Seaweed is probably more palatable in its raw state, and the best types will be found amongst the pink and purple variety and the reddish or green types.

97. ***Water Lilies.*** Those types found on the surface of freshwater lakes and in streams are a source of food. All these types are edible, and the seeds and thickened roots of all varieties may be eaten boiled or roasted.

WATER LILIES

98. ***Fruits.*** It is amongst the infinite number of different fruits to be found in the tropics that the main troubles lie. There are quite a number of poisonous types, and it would be well to receive some local advice as to those types found in abundance, which are either edible or poisonous. Fruit found in native allotments is safe to eat.

Poisonous Plants

99. In order to avoid the poisonous plants to be found throughout the tropics, and in particular the Far East, the following rules should be observed and the list of poisonous plants identified and memorized:—

(*a*) Do not eat red—or brightly coloured—fruits and berries unless you know them to be harmless. Avoid anything looking like a

tomato, though it might smell quite pleasant.

(*b*) Do not eat roots, fruits, and vegetables with a bitter, stinging, or otherwise disagreeable taste. If in doubt, taste with the tip of your tongue, or take a minute piece spitting it out immediately should you consider it to be amongst the poisonous variety.

(*c*) Avoid all contact with any plant, shrub, or tree, with a milky sap.

(*d*) On certain types of young bamboo there is a prickly form of down, which causes intense irritation and sores. When working this type of bamboo, be certain to wear your jungle gloves, or at least cover your hands.

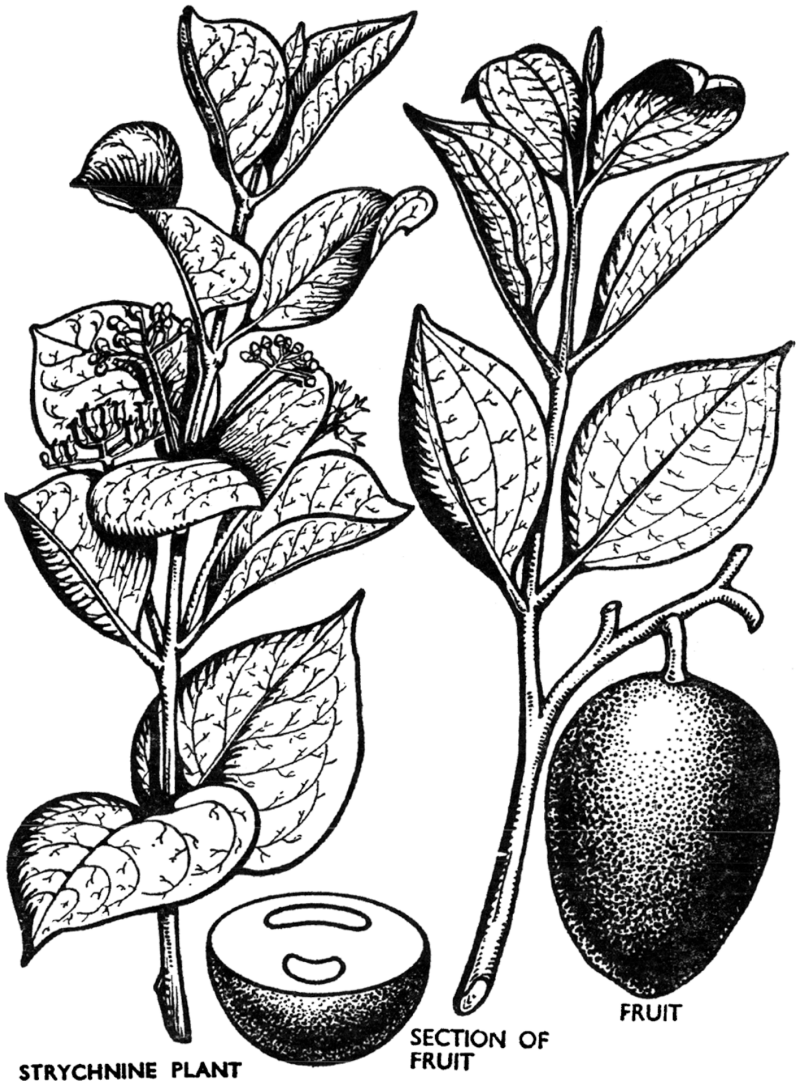
(*e*) Leave all toadstools or mushrooms alone.

(*f*) Because birds and animals eat certain types of plants, it is no guarantee that it will be safe for human consumption, as most animals can digest foods that are poisonous to man. In an emergency, if you can find nothing eatable, watch the food the monkey eats, as you can be certain that he is eating food fit for human consumption.

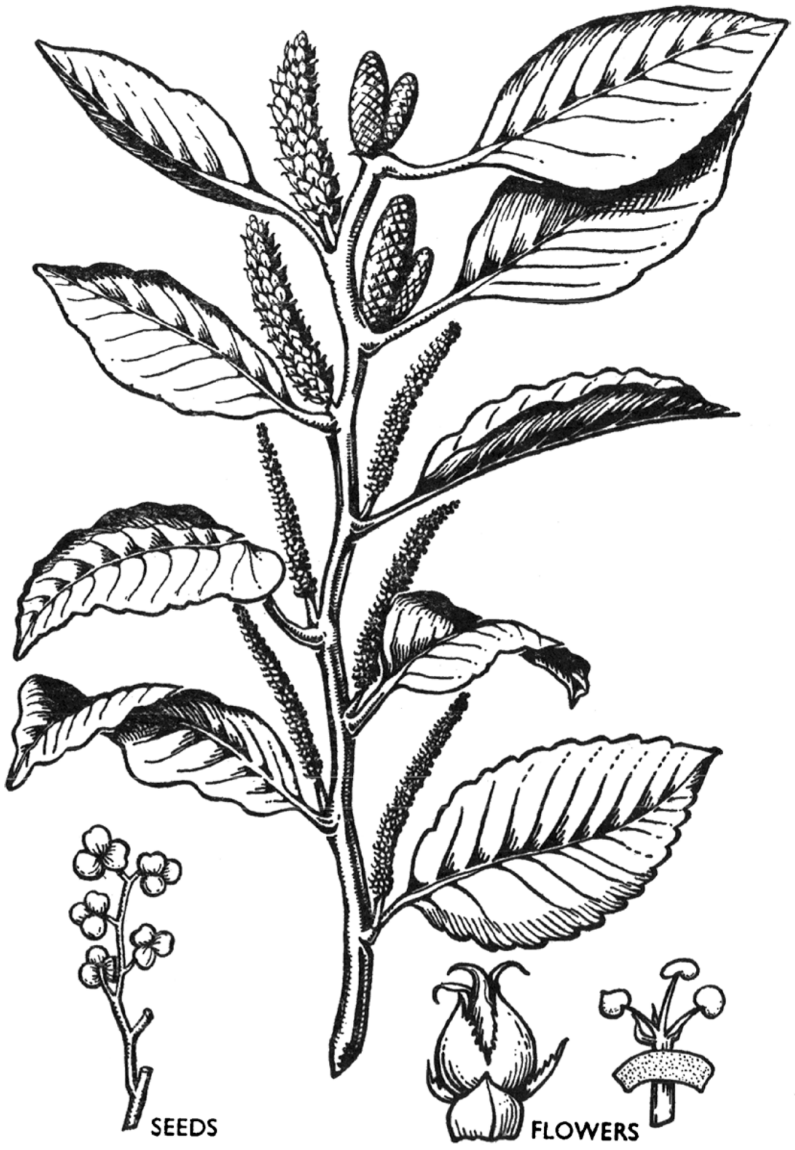
100. ***List of Poisonous Plants.*** A few of the most common and more dangerous of the poisonous plants are listed separately as follows:—

(*a*) ***Strychnine Plant***.

Grows wild throughout the tropics. Seeds contain deadly strychnine.



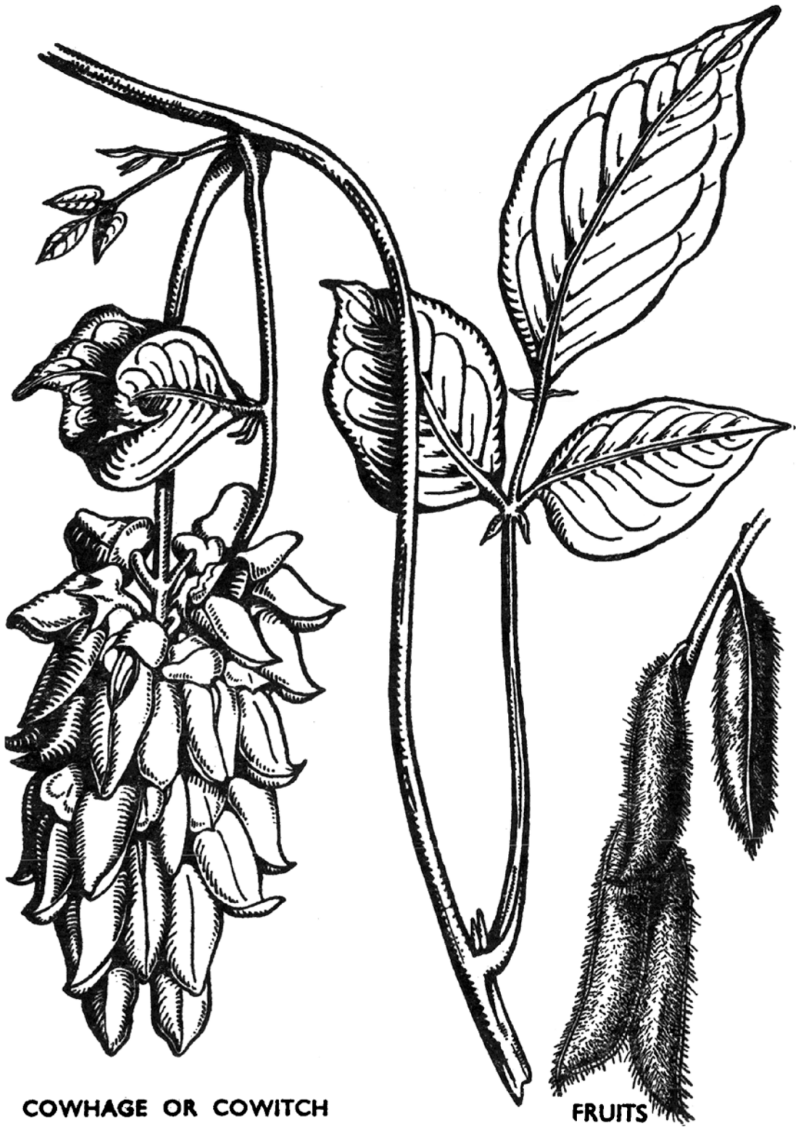
(*b*) ***Milky Mangrove, or Blind-your-eyes.***
Found in mangrove swamps, on coast or estuaries. Sap causes blistering, blindness if in the eyes.



MILKY MANGROVE, OR BLIND-YOUR-EYES

(*c*) ***Cowhage, or Cowitch.***

Found in thickets, and scrub. Not in true forest. Hairs on flowers, and pods, cause irritation and blindness if in the eyes.

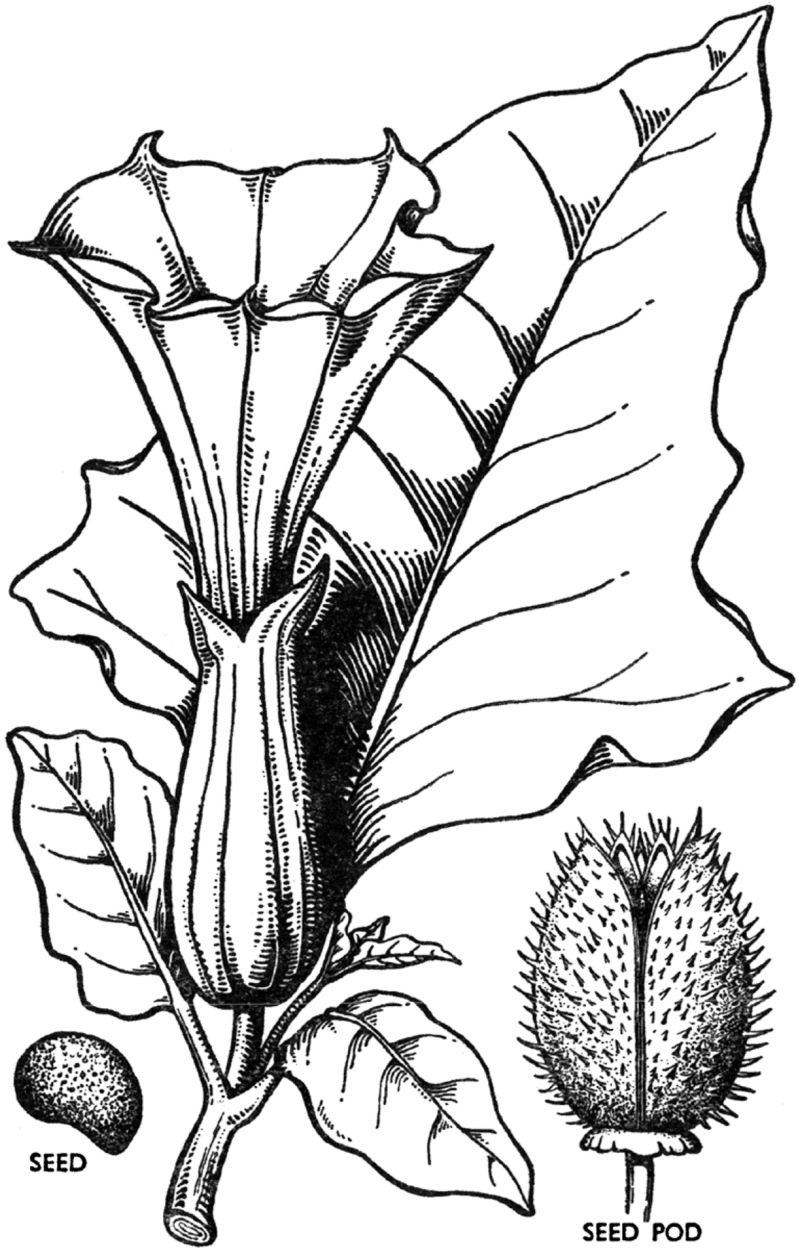


(*d*) ***Nettle Tree.***

Widespread, especially in and near ponds. Poisonous to touch, causing burning sensation. Relieve with wood ashes, moistened.

(*e*) ***Thorn Apple.***

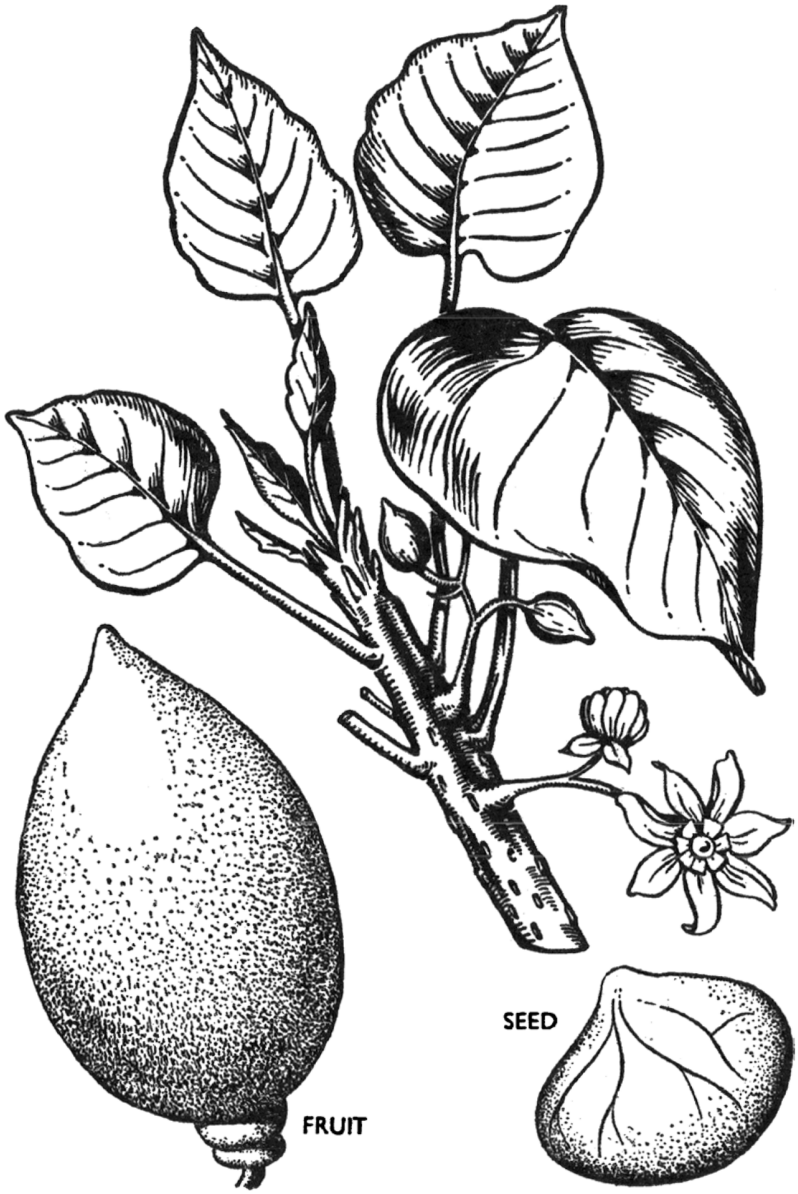
Common weed of waste and cultivated land. All parts, especially the seeds, are poisonous.



THORN APPLE

(*f*) ***Pangi.***

Found mainly in Malayan forests. Seeds of the large brown fruits contain prussic acid.



PANGI

(*g*) ***Physic Nut.***

Common in fences, and hedgerows. Large seeds, violently purgative.

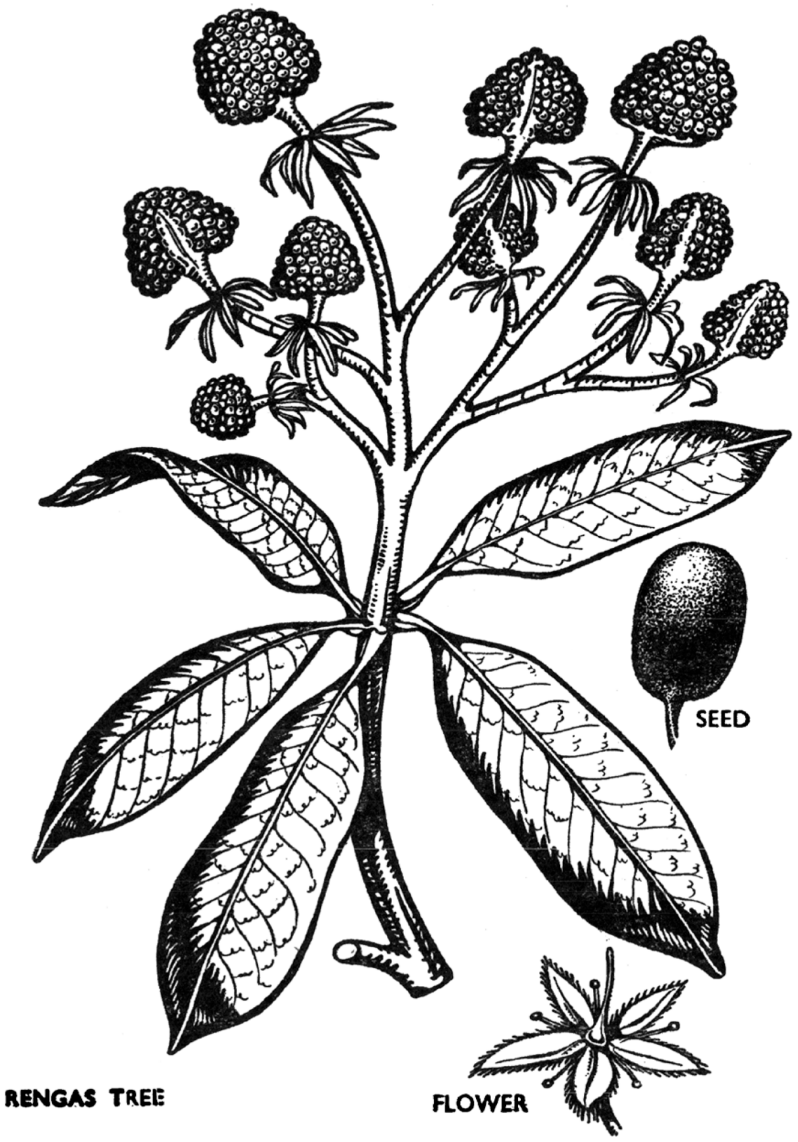
(*h*) ***Castor Oil Bean.***

A shrub-like plant common in thickets and open sites. Seeds are poisonous, and a violent purgative.

CASTOR OIL BEAN

(*j*) ***Rengas Tree***

Widespread in Malayan forests. Localized rash caused from contact with bark, timber, or water off the tree.

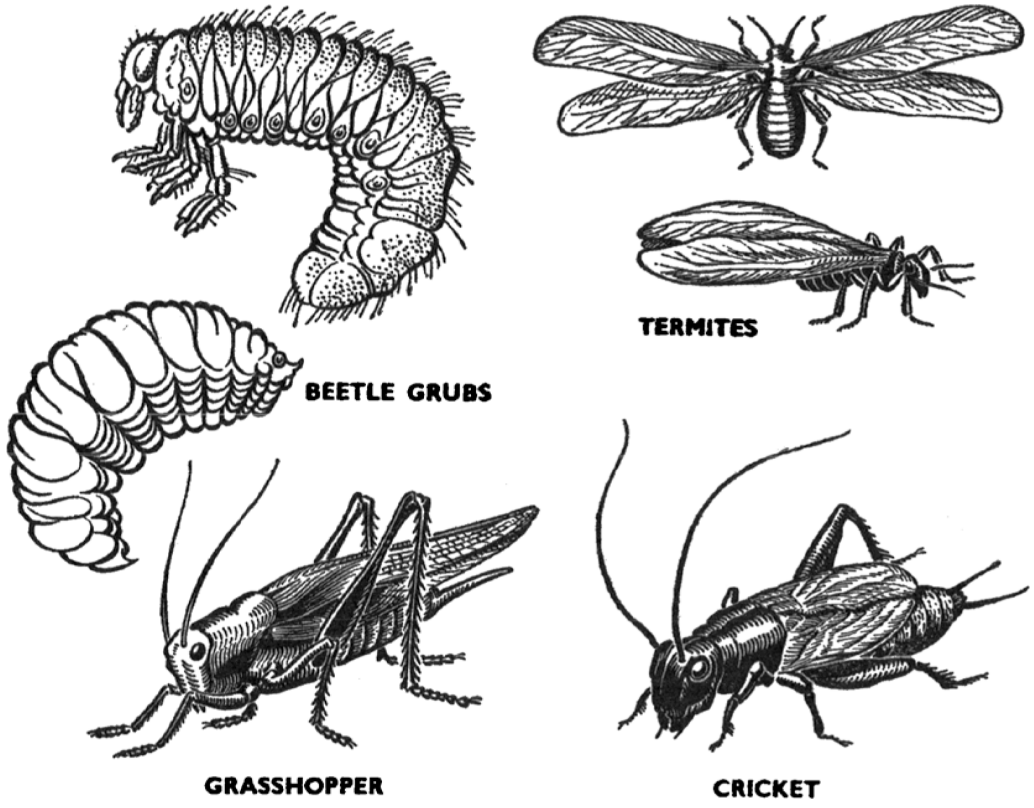


Meat, Birds and Insects

101. ***Birds.*** All birds are edible, though a few, including the carrion-eating vultures and kites, have a flesh which is most unpleasant to the taste.

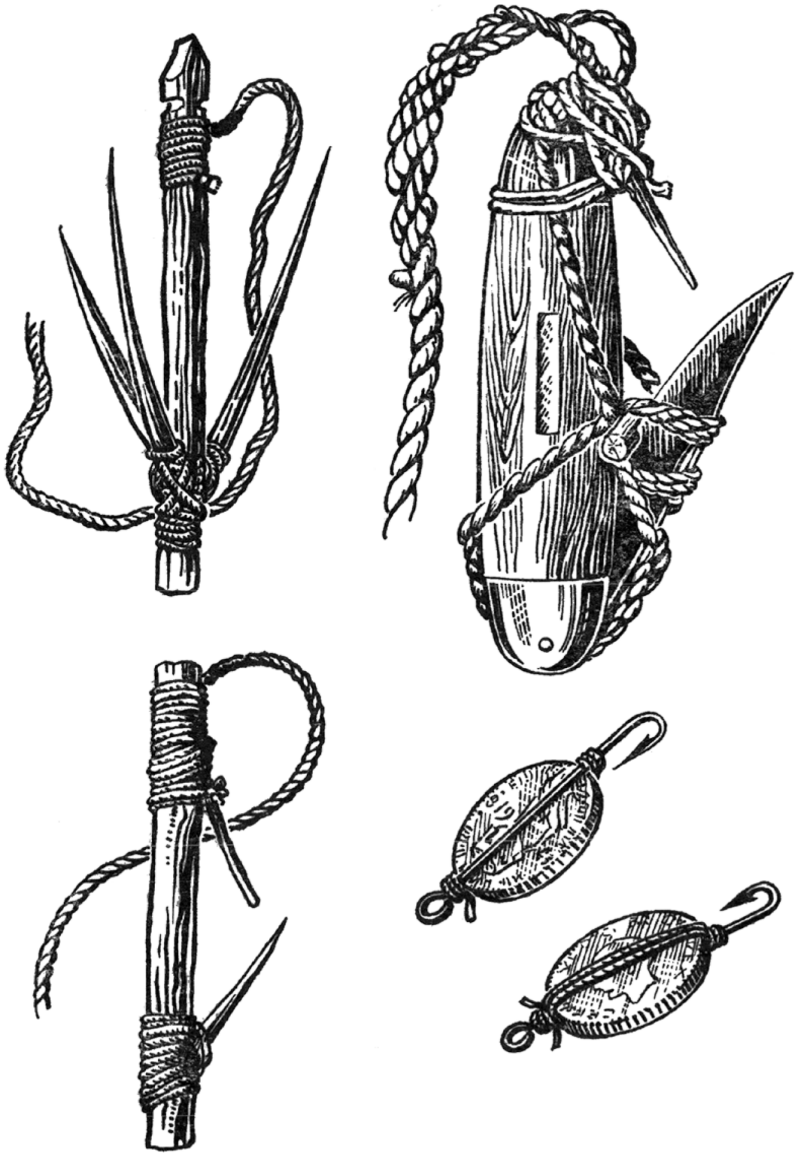
102. ***Lizards and Snakes***. All these are edible, the meat from the hind quarters and tail in the case of the lizard being the best. Snakes are not going to be so easy to catch, or to find for that matter, but if you do happen to contemplate a meal of snake, remove the head immediately the reptile has been killed. Frogs are quite good food but they should be skinned before cooking.

103. ***Ants, Grubs, etc.*** Natives consider the white ant as a delicacy, either cooked or raw, with the wings removed. Also the white grubs of wood-infesting beetles are edible, and will be found quite palatable, if split and broiled over a fire. They will be found in decaying and rotten wood. Such insects as grasshoppers and crickets may be toasted over a fire, the wings and legs having first been removed.



EDIBLE INSECTS

104. ***Animals.*** Too much reliance should not be placed on animals as a source of food. They are not only difficult to catch, but finding them in the first place may present quite a problem, and killing them and disposing of the flesh will also need considerable thought. Those animals most easily found and caught are probably the various species of deer and wild pig but you will need a gun to kill them. A bow and arrow will kill small birds and animals; you can catch others in traps.



Fish

105. All areas of water, lakes, streams, and rivers contain a variety of life, most of which will be found to be edible. If camping in the vicinity of water there should be no danger of shortage of either food or water—fresh or purified—all of which can be obtained from such a source. Animal life is more abundant in water than on land, and generally speaking, is more easily caught. The chances of survival along a body of water are always excellent, and fish may be caught with crude equipment, if you know when, where, and how to fish.

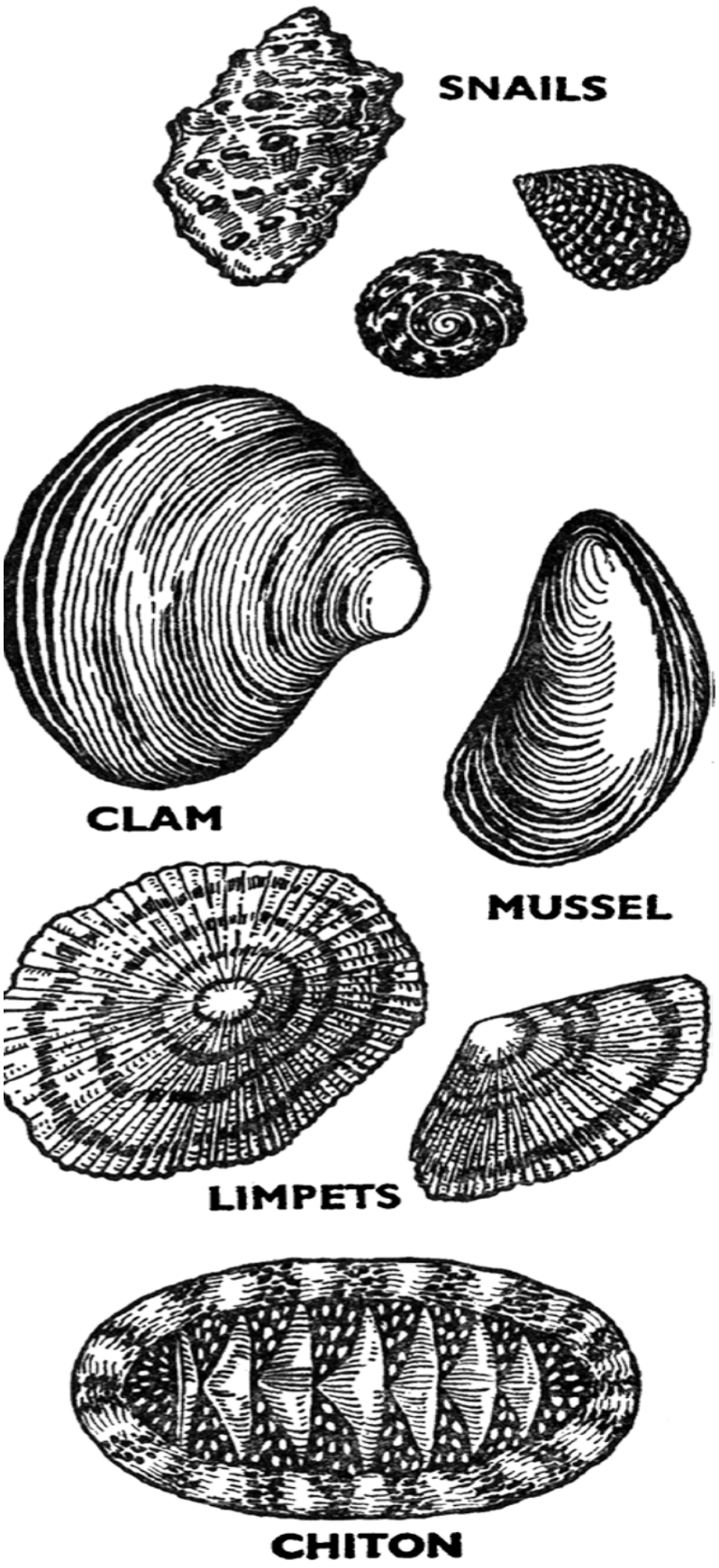
106. ***When to Fish.*** Different species of fish feed at all times of the day or night, though there are many governing factors relating to feeding activity; however, in general, early morning and later afternoon are the best times to fish with bait. Fish rising or jumping are sure signs of feeding.

107. ***Bait.*** Experiment with bait, and try to obtain your baits from the water, as such bait will be more natural. Such life as insects, shrimps, worms grubs, small minnows, or even the meat of a jellyfish, are all good bait; in addition the wasted parts of the fish themselves, that is the eyes, head, intestines. If a certain type of fish appears plentiful, having caught the first one, open it up and find out on what it feeds, and endeavour to find a similar bait.

108. ***Technique.*** Try to conceal the hook in the bait, and approach the fish upstream, as they normally lie heading into the current. In clear shallow water, move slowly to avoid frightening, and if unsuccessful, try fishing after dark.

109. ***Hooks and Lines.*** Hooks can be made from pins, needles, wire, or any pieces of available metal; fishing gear can also be made from wood, bamboo, bones, large thorns, or a combination of these; see illustrations. Lines can be made from a great variety of plants, or the wiry stems of high climbing ferns, and the inner bark of trees, or the skin of the banana tree-

trunk. For added strength a number of these can be twisted or platted together.


SNAILS
CLAM
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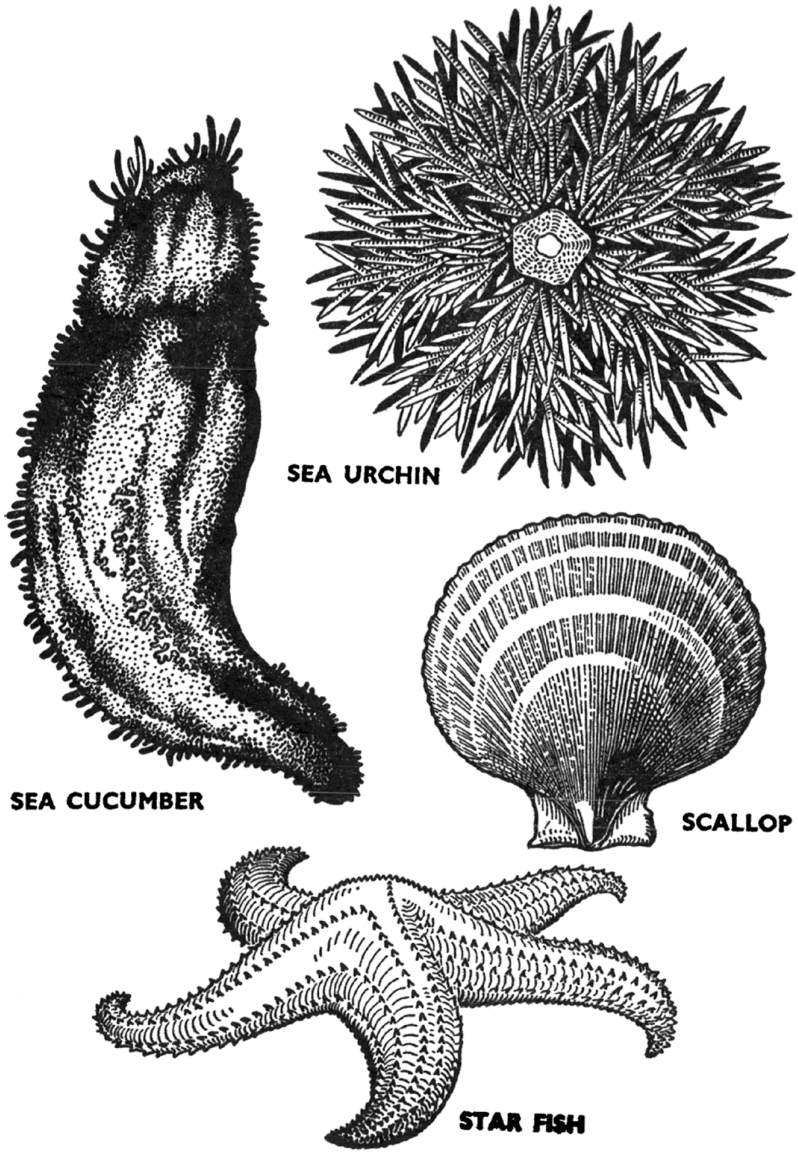
CHITON



EDIBLE SEA FOOD

110. ***Crustaceans.*** Crabs, crayfish, lobsters, shrimps, and prawns are found in fresh water throughout the world; all of them are edible, though they will spoil quickly. As is the case for all types of fresh water fish, the crustaceans contain parasites harmful to man, and must always be cooked before serving. Many species are nocturnal in their habits, and may be caught more easily at night. All the meat within the skeleton of crabs, crayfish, and lobsters can be eaten, but the gills are usually discarded. Fresh water shrimps are abundant in tropical streams, and can be seen swimming or

found standing stationary on the rocks and the sand of the stream bed. Look for them in the quieter parts of a stream where the water is sluggish. They can be caught quite easily with a small cane, with a loop at the end made from the skin or bark of a tree. The idea is to drop the loop over the eye of the shrimp, which protrudes from its head, and with a quick movement the shrimp is caught in the loop. They will rise to the surface at night, if a light is placed close to the surface, and may be scooped off.

111. ***Fish Traps.*** A simple and very useful fish trap, capable of catching all types of creatures found in fresh and salt water, can be made from two pieces of bamboo. The scheme is to obtain one small piece about a foot in length, and another rather larger and somewhat longer piece, perhaps about two feet. Split each piece down from the top, leaving the bottom intact, force the ends out to form a cone, and then place one cone inside the other, attaching the edges together with cord, or some fine flexible vine or rattan. A hole made in the smaller cone will turn this device into a simple "lobster pot", and two or three of these placed in the stream near to the camp will produce meals without time or effort being spent. (see illustration to para 127).

NATIVES

112. In peacetime you can expect natives to be friendly. In troubled areas you will be briefed of possible hostility before flight. The natives will, no doubt, know of your presence however quietly you may approach. If uncertain of your reception, send one member of the party into the village first. Whilst he is away, move to another position; in the event of antagonism, it will be possible to get away before the natives appreciate that you have moved from your point of observation.

113. Having made contact, if receiving shelter or hospitality from natives, throughout the time you are with them consider the following points:—

(*a*) Deal with chief, or headman, and ask, do NOT demand.
(*b*) Show friendliness, courtesy, and patience—don't be scared, as fear tends to make them hostile.
(*c*) Do not threaten or display weapons.
(*d*) Greet natives as you would your own kind.

(*e*) Make gifts of small personal belongings and trinkets.
(*f*) Take plenty of time when approaching either them, or their village.
(*g*) Make use of the sign language; when ready state your business briefly, and frankly.
(*h*) Treat natives like human beings, and don't "look down" on them; after all, you will be wanting their help sooner or later.
(*j*) If you make a promise be sure to keep it.
(*k*) Respect local customs and manners.
(*l*) Endeavour to pay in some manner for what you take; using tobacco, salt, razor blades, matches, cloth, empty containers, etc.
(*m*) LEAVE THE NATIVE WOMEN ALONE—only have contact with them when on "official business".
(*n*) Respect their privacy, do not enter their homes until asked.
(*o*) Learn their laws, and abide by them—bounds, animals, etc.
(*p*) Entertain and be a good audience.
(*q*) Take practical jokes in good fun.
(*r*) Try to pick up bits of their language; they will appreciate your efforts, when you make use of some of their words.
(*s*) Avoid all leading questions—with the answer "yes" or "no".
(*t*) Learn their woodcraft, and the sources from which they obtain food and drink.
(*u*) If living amongst natives, endeavour to avoid personal contact with them as much as possible; make your own shelter, and produce and cook your own food and drink.
(*v*) Always be friendly, firm, patient and, above all, honest.
(*w*) When you depart be sure to leave a good impression.

SURVIVAL EQUIPMENT

114. Survival equipment is available in two forms, namely emergency packs which are carried in larger aircraft, and personal survival kit. This equipment should be carried on every flight, and frequent checks should be made to ensure that it is intact and in good condition. Every item is invaluable and it is imperative that you should know how to use the equipment to the maximum advantage before the emergency arises.

PERSONAL HYGIENE AND FIRST AID

115. It is most important for the “jungle hiker” to appreciate the necessity of taking every precaution against disease and infection, caused from lack of care and attention. One of the most important, though not the most obvious —so it seems from past experience—is the care of the feet.

116. ***Care of the Feet.*** Since a hiker will not get very far if his feet let him down, all hikers must take care of the feet. This involves the discarding of all footwear at the end of the day, the washing and rinsing of socks or stockings, leech stockings—if used—and jungle boots, etc., and also the feet. Allow footwear to dry by the camp fire overnight, and replace the following morning. Try to prevent foot-rot, as once it develops it is most difficult to eradicate.

117. ***Camp Sanitary Arrangements.*** All camp sanitary arrangements and refuse pits, etc., must be well clear of the camp. When any waste is deposited, a layer of earth should be thrown in to cover it, and thus avoid infection.

118. ***Water.*** Take great care to see that precautions as suggested in paras. 79-83 are enforced. Try to avoid camping too close to your water supply, and when collecting water, or washing, etc., in the vicinity of a stream or watercourse, do NOT hang around in a half clad state, but get away from the midges, mosquitoes, and other irritating forms of insect life, as soon as possible. See that members of the party wash at least once a day, paying due care to anti-malarial precautions, etc.

119. ***Bites.*** If leeches and ticks are removed by one of the recognized methods (see para. 34) there should be no danger. The small amount of bleeding after the leech has released its hold ensures the wound being clean. If in doubt apply some antiseptic. This also applies to ticks, methods for the removal of which will be found in para. 35. Untreated bites may develop into jungle sores.

120. ***Snakes.***

(*a*) Though the danger from snake-bites is considerable, it is by no means as great as one is led to believe. Untreated snake-bites,

even that of a cobra, are not always fatal; though this will depend to some extent on the health of the victim, and that of the snake; and upon whether the snake has exhausted its poison or not, in the process of feeding; the poison being a digestive agent. Death, from a snake-bite, may be caused either from the snake venom, or from shock and fear. In dealing with such a bite, it is necessary to act swiftly—seconds count—but KEEP CALM.

(*b*) Treatment of a snake-bite aims at preventing the absorption of the poison into the system, and the reduction of the poison from a possible fatal dose to a non-fatal dose.

(*c*) Make a lengthwise cut through the bite, and as deep as the bite, with additional shallow cut near the wound. Cut parallel to blood vessels and tendons, don't cut indiscriminately.

(*d*) Suck out the blood and venom, if your mouth and lips are free from cuts and sores, otherwise force out by squeezing.

(*e*) If a limb has been bitten, place a tourniquet above the wound, ***i.e.*** between wound and heart, but take care to avoid stopping the blood flow from the heart to the wound, as the bleeding will assist in removing the poison. To do this, tighten the tourniquet until the pulse stops, then loosen so the pulse is just felt. If the wound is in the lower part of the arm or leg, use a tourniquet above the joint, and another above the wound, massaging the limb towards the wound to encourage the blood flow. Loosen tourniquet every 15 to 20 minutes.

(*f*) Keep the victim quiet, and avoid any movement or exercise, stimulant and/or alcohol. A cold wet cloth applied in the vicinity of the wound will tend to delay the absorption of the venom.

(*g*) Kill the snake, if possible, as this will help considerably in identification; an important point if serum is available.

(*h*) Do not cauterize, or use potassium permanganate, as this destroys the tissues, and does more harm than good.

NOTE. The above instructions also apply to bites from most poisonous insects and reptiles, except that as few of these are ever likely to prove fatal, the application of a tourniquet may not be necessary.

121. ***Blisters.*** Remove all pressure from a blister; by cutting away shoes and improvizing footwear from parachute packs and canopy, or plant leaves and fibres, in the case of the feet. If the cause is due to equipment carried, improve on the carrying arrangements, and if too weighty, consider slinging on a bearer, carried by two members of the party. Avoid breaking a blister, but prick the edge with a sterilized instrument—hold in flame or boiling water—and press out the fluid. Keep the blister clean and dry, using bandages improvized from parachutes, clothing, etc., and don't overlook any disinfectant that is available. If blisters should continue to give trouble, the best way of avoiding complications is simply to stand fast for a day or two. Bathing one's feet in very hot salt water is most comforting, and also hardens the skin. See para. 116 for "Care of the Feet".

122. ***Rashes.*** Those caused from contact with various forms of poisonous plant can frequently be relieved by the application of some oil and bandaging. If no oil is available, coconut oil can quite easily be obtained from the nuts, or apply some wood ash, moistened in water, as a paste, which will be found quite soothing. Prickly-heat and foot-rot are both caused from poor personal hygiene, and if suffering to any extent with either it is best to rest for a few days, to allow the skin to heal. To acclimatize the skin against prickly-heat and sunburn acquire a good tan as soon as you can. When you are working hard or walking fast wear your shirt outside your trousers to allow air to circulate close to the skin.

123. ***Insects—General.*** There is available a very effective insect repellent, and when travelling through the jungle make good use of it. A band about an inch wide, placed around the upper part of the jungle boot, or on the trouser-leg, or stocking, will discourage the advance of leeches, both during the "hike" and particularly during "stand-easy". If using the parachute hammock, soak an inch or two of the shroud lines in the repellent, and you will not be worried by insects, which might attempt to approach along such a "line of communication".

JUNGLE CRAFT

124. The ability to provide yourself with shelter, camping equipment and food, will increase your chances of survival, and at the same time, reduce

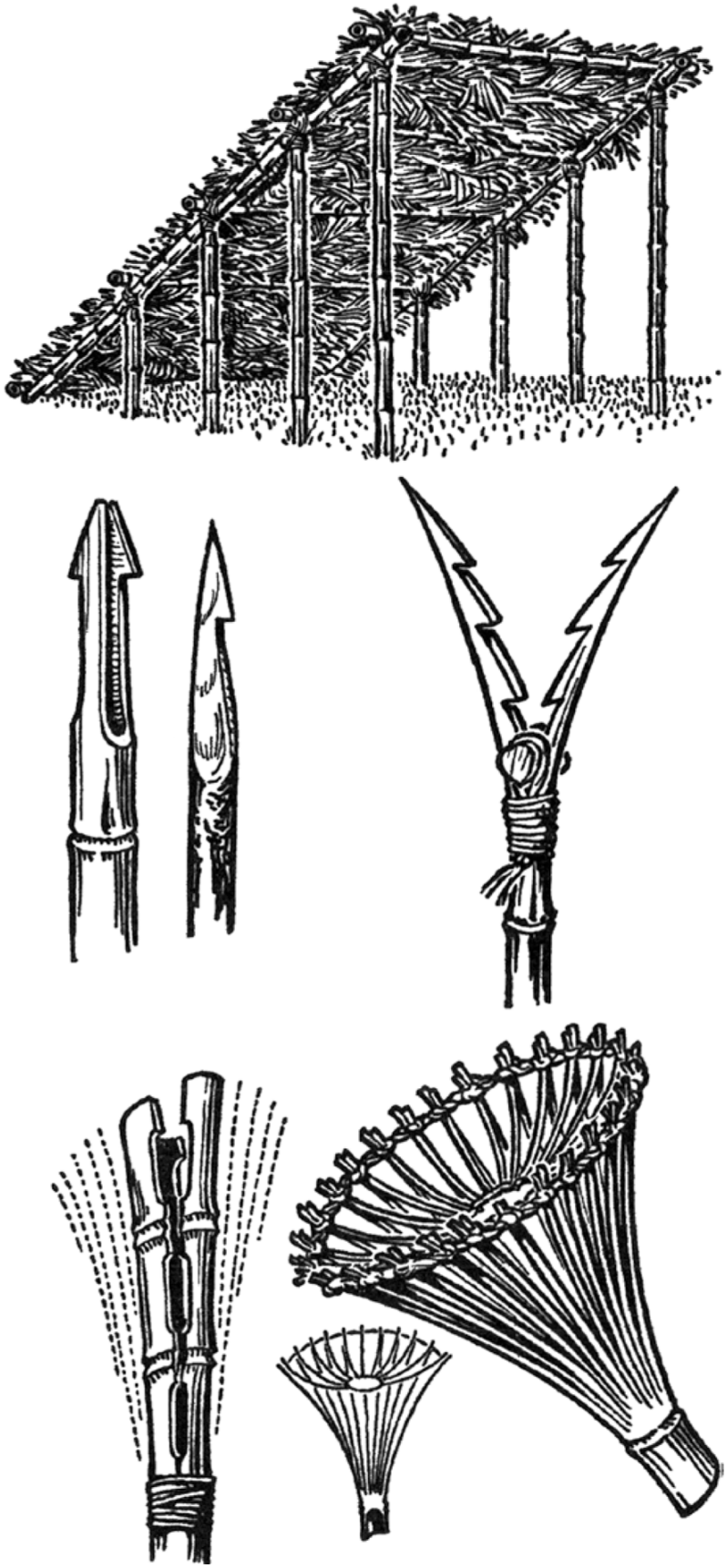
your own physical hardships. One of the most useful and most common sources of material for jungle-craft is the bamboo. This will be found in abundance along streams or rivers which you may be using as a means of communication or transport, and with the aid of a good jungle knife, and a little imagination, can be turned into all manner of useful articles. A word of warning to those who start working bamboo; be careful of the hard and extremely sharp outer skin, which will split up, and may very easily cause a deep and subsequently dangerous wound.

125. Though bamboo may seem rather difficult to work to the inexperienced, after two or three days the art will develop, when its uses in camp and the daily jungle routine will be found inexhaustible. Not only can the stems be used, but the leaves, if laid over a framework to form a roof, will be found durable and weatherproof.

126. Apart from watching out for cuts from the outer skin, the only points to remember in working are the methods of cutting. First, if cutting through the stem, make the cut at about 45°-50°, when it will be found quite simple to make a clean cut, without splitting. Sometimes it may be necessary to cut longitudinally, such as when making table-tops, or fish traps (see para. 111) in which case lay the bamboo on firm ground, and cut into it with a strong easy stroke, rolling the bamboo, and thus working round its circumference.

127. Some of the more common forms of equipment improvized with the aid of bamboo are listed and illustrated:—

(*a*) Simple lean-to shelter, or more complex hut or bungalow.
(*b*) Furniture, such as chairs, tables, beds, etc.
(*c*) Household tools, and hunting weapons, harpoons, etc.
(*d*) Cooking and boiling or stewing pots, and drinking mugs.
(*e*) “Clappers” for use as sound signalling apparatus.
(*f*) Traps, for catching fish, and all forms of wild animal, large or small.
(*g*) Rafts, and barges, for transporting personnel and equipment.
(*h*) Finally, bamboo may be burnt as fuel, if broken up and left in the sun to dry, and the shoots are quite a delicacy as food.



128. A question that is often asked is: “We know it is quite possible to make a great number of useful implements from bamboo, and other plants, but they all require a lot of cord, or rope. How are we going to make do, unless we have a regular and continuous supply of such material?” This is a very important point, but one that is soon put right, as there are inexhaustible supplies of plants from which cord, lines and rope can be made. A list of these is given below:—

(*a*) ***Breadfruit.*** Strands of inner bark.
(*b*) ***Plantain and Bananas.*** Fibrous tissues and mature leaf stalk, and strands from the outer covering of the trunk of the banana tree, will make good fishing line.
(*c*) ***Coconut Palm.*** Fibres of coconut husks, and midrib of leaves.
(*d*) ***Liana.*** Smaller stems, and the fibres of larger ones.
(*e*) ***High Climbing Ferns.*** Wiry stems are very durable under water.
(*f*) ***Climbing Canes.*** Stems.
(*g*) ***All Vines and Rattans.*** Smaller flexible stems, or stem fibres.
(*h*) ***Tropical Weeds.*** Fibre from inner bark.
(*j*) ***Wild Hibiscus.*** Stem fibres.
(*k*) ***Screw Pine.*** Leaf fibres.

JUNGLE SURVIVAL TRAINING

129. ***Practical Experience and Familiarization.*** The first and most important step in survival training is to look at some jungle. If you are stationed in the Far East there is likely to be some jungle within reach. If, however, you are in a well developed part of the country, the local areas of forest reserve will provide what you want. Even a ten minutes’ stroll along a jungle path will enable you to appreciate the problem of survival and movement. Squadron and station rescue officers should organize short trips through the jungle with a local guide who can point out edible and poisonous plants. This training should be developed until air crew are capable of making cross country journeys from point to point through jungle with the aid of a compass. If jungle hiking alone becomes boring,

hunting and shooting excursions will add interest and perhaps reward to the training.

130. ***Plant and Animal Familiarization.*** Most towns in the Far East have their own botanical gardens; the large cities have museums and sometimes zoos. The curators of these institutions will be only too pleased to help you identify the plants in their collection and will point out poisonous snakes, etc. Station rescue officers should maintain a regular programme of visits to such places.

131. ***Jungle Craft.*** Survival training on the station should include practical work in Jungle Craft. Aircrew should practise fire lighting (without paper), making animal traps, fishing, shelter building, raft making, and use of bamboo, etc. One can also usefully practise the art of opening coconuts.

CONCLUSIONS

132. The jungle is by no means as formidable a place as the average person imagines. There are many difficulties and snags; but the large majority of these can be surmounted, and eventually, with due care, consideration, and perseverance, one can expect to arrive amongst friends. Undoubtedly a little weary, worn, unkempt, and certainly sick of jungle foods, hard rations, and the irritating forms of jungle life; but nevertheless, safe and sound, ready to carry on as before.

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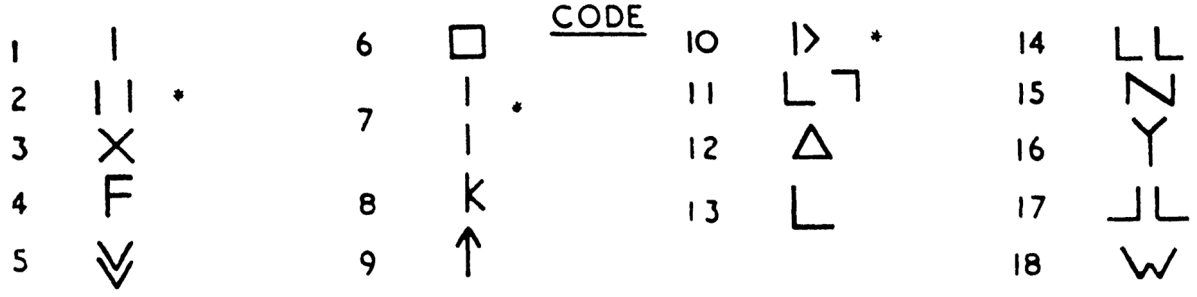
Ground/Air Emergency Code for Use in Air/Land Rescue Search

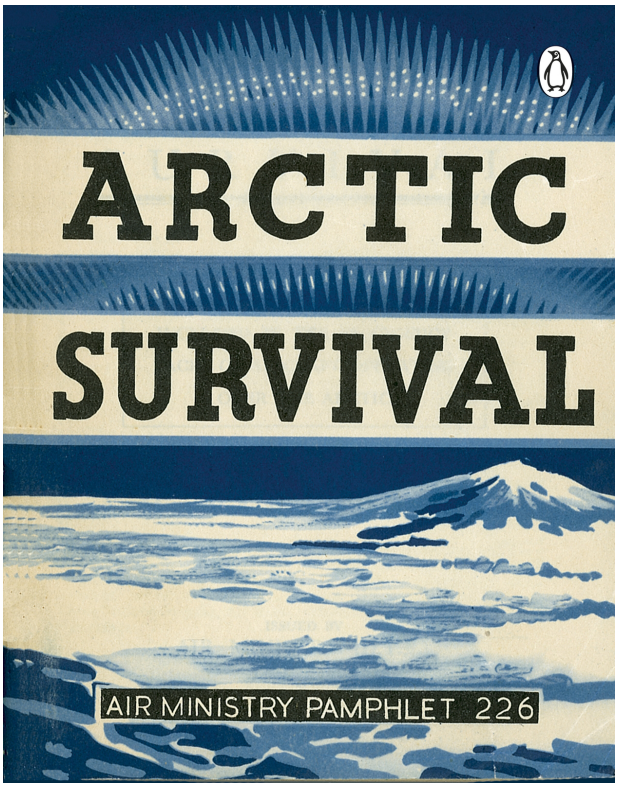
KEY

1	REQUIRE DOCTOR, SERIOUS INJURIES	10	WILL ATTEMPT TAKE-OFF
2	REQUIRE MEDICAL SUPPLIES	11	AIRCRAFT SERIOUSLY DAMAGED
3	UNABLE TO PROCEED	12	PROBABLY SAFE TO LAND HERE
4	REQUIRE FOOD AND WATER	13	REQUIRE FUEL AND OIL
5	REQUIRE FIREARMS AND AMMUNITION	14	ALL WELL
6	REQUIRE MAP AND COMPASS	15	NO
7	REQUIRE SIGNAL LAMP WITH BATTERY, & RADIO	16	YES
8	INDICATE DIRECTION TO PROCEED	17	NOT UNDERSTOOD
9	AM PROCEEDING IN THIS DIRECTION	18	REQUIRE ENGINEER

CODE



* A SPACE OF 10FT BETWEEN ELEMENTS WHEREVER POSSIBLE



First issued to airmen in the 1950s, this reprint of The Air Ministry's Arctic Survival pamphlet includes emergency advice to crew operating over arctic regions.

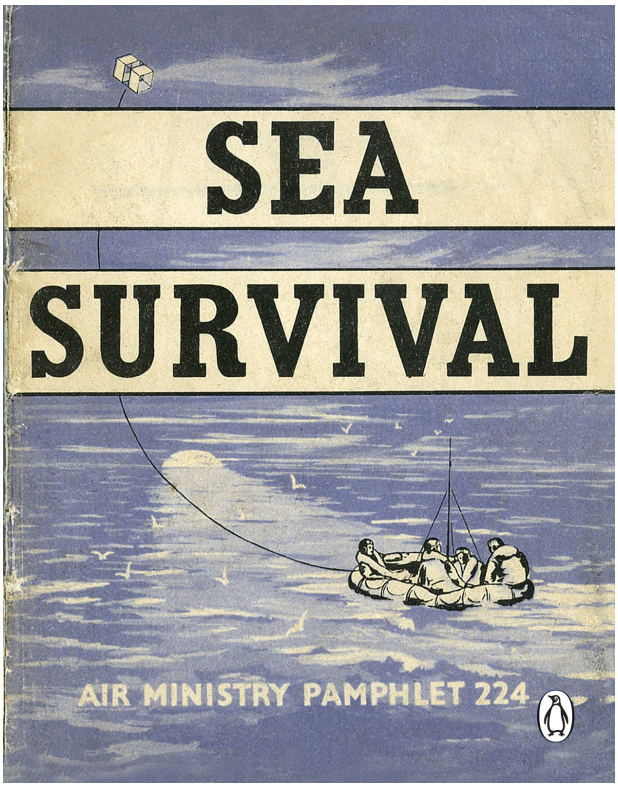
Packed with original line drawings and instruction in:

● The best faces to pull to prevent frostbite and, should you fail, when you can expect bits of you to 'fall off'

● How to build a structurally sound igloo

● How to fashion a mask to prevent snowblindness

OUT NOW

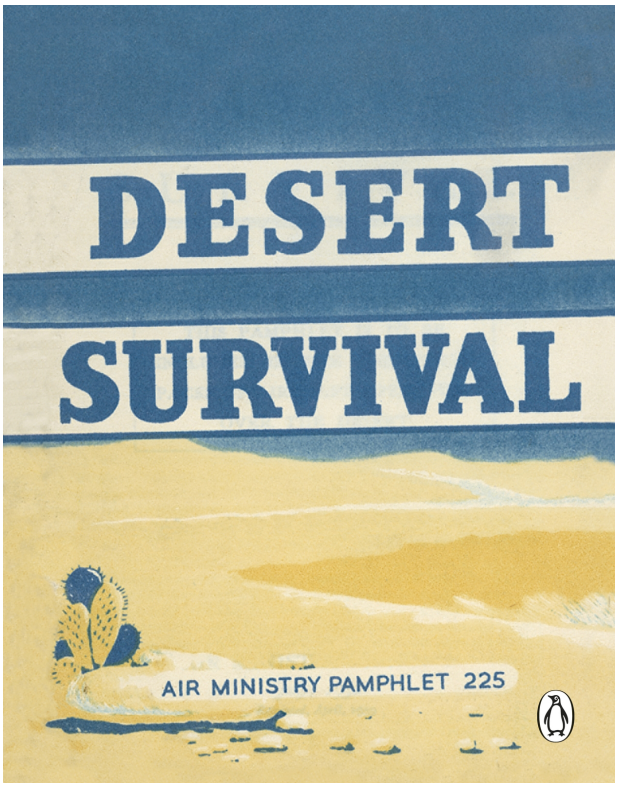


First issued to airmen in the 1950s, this reprint of The Air Ministry's Sea Survival pamphlet includes emergency advice to crew operating over sea regions.

Packed with original line drawings and instruction in:

- How to punch man-eating sharks, which are 'cowards'
- The pros and cons of drinking 'fish juice'
- When to smoke

OUT NOW



First issued to airmen in the 1950s, this reprint of The Air Ministry's Desert Survival pamphlet includes emergency advice to crew operating over desert regions.

Packed with original line drawings and instruction in:

- How to find water in a dry stream course
- How to make a hat out of seat cushions

OUT NOW

THE BEGINNING

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